COMPLETED

FLOOD INSURANCE STUDY

ORIGINAL

COUNTY OF WARREN, OHIO

UNINCORPORATED AREAS

REVISED:
AUGUST 4, 1987

Federal Emergency Management Agency

WASHINGTON, D.C. 20472

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NOTICE TO
FLOOD INSURANCE STUDY USERS

Individual components of this Flood Insurance Study (i.e., text, tables, profiles, and maps) are subject to revision as additional data become available. Because revised components may be issued separately, study users should consult the community map repository for those components that are currently effective.

In cases where this Flood Insurance Study and any components thereof warrant revision, a Revisions Description section may be incorporated into this text. When applicable, study users should refer to the Revisions Description to obtain pertinent data and information concerning revisions.

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Flood Boundary and Floodway Map

PUBLISHED SEPARATELY:

Flood Insurance Rate Map Index
Flood Insurance Rate Map

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FLOOD INSURANCE STUDY

COUNTY OF WARREN,
UNINCORPORATED AREAS, OHIO

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study investigates the existence and severity of flood hazards in the unincorporated areas of Warren County, Ohio, and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study will be used to convert the unincorporated areas of Warren County to the regular program of flood insurance by the Federal Insurance Administration (FIA). Local and regional planners will use this study in their efforts to promote sound flood plain management.

In some states or communities, flood plain management criteria or regulations may exist that are more restrictive or comprehensive than those on which these Federally-supported studies are based. These criteria take precedence over the minimum Federal criteria for purposes of regulating development in the flood plain, as set forth in the Code of Federal Regulations at 44 CFR, 60.1 (d). In such cases, however, it shall be understood that the state (or other jurisdictional agency) shall be able to explain these requirements and criteria.

1.2 Authority and Acknowledgements

The source of authority for this Flood Insurance Study is the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

The hydrologic and hydraulic analyses for this study were performed by Vogt, Ivers and Associates, Inc., for the Federal Insurance Administration, under Contract No. H-3979. This study was completed in October 1977.

1.3 Coordination

Community base map selection and the identification of streams requiring detailed study were performed in a meeting attended by representatives of the Ohio Department of Natural Resources, the FIA, the Study Contractor, the Warren County Regional Planning Comission, and the Warren County Engineering Department. On February 2, 1977, and July 15, 1977, the flood elevations, flood boundaries, and flood delineations were reviewed with county officials and met with their approval.

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On December 5, 1979, the results of the work by the Study Contractor were reviewed and accepted at a final coordination meeting attended by personnel of the State Department of Natural Resources, the FIA, and the Study Contractor.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the unincorporated areas of Warren County. Incorporated areas excluded from this study were Butlerville, Carlisle, Corwin, Franklin, Harveysburg, Lebanon, Loveland, Maineville, Mason, Monroe, Morrow, Pleasant Plain, South Lebanon, Springboro, and Waynesville. The area of study is shown on the Vicinity Map (Figure 1).

The areas studied by detailed methods were selected with priority given to all known flood hazard areas, and areas of projected development or proposed construction through 1982.

Approximate methods of analysis were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to and agreed upon by the FIA and the unincorporated areas of Warren County.

The flooding sources studied by detailed methods and their limits of study are shown in Table 1, Flooding Sources. Flooding sources in the Great Miami River basin and the Little Miami River basin not studied by detailed methods were studied by approximate methods.

2.2 Community Description

Warren County is located in southwestern Ohio and lies approximately 20 miles northeast of Cincinnati. It is surrounded by Hamilton to the southwest, Butler to the west, Montgomery to the northwest, Greene to the northeast, Clinton to the east, and Clermont to the southeast. Warren County, with its relatively close proximity to Cincinnati and Dayton, is growing residentially as indicated by an increase from 65,711 to 85,505 in the 1960 and 1970 census statistics, respectively (Reference 1). The county is primarily agricultural, with some commercial and industrial operations generally near the incorporated areas.

The major cities in the county are Lebanon, the county seat; Franklin, the most populated; and Mason. Other incorporated communities are Springboro, Waynesville, Morrow, South Lebanon, Corwin, Harveysburg, Carlisle, Butlerville, Pleasant Plain, and parts of Loveland and Monroe.

The climate of the area is characterized by warm summers with temperatures occasionally rising above 90 degrees Fahrenheit (F.) and moderately cold winters dropping to near 0 degrees F. The annual precipitation over the

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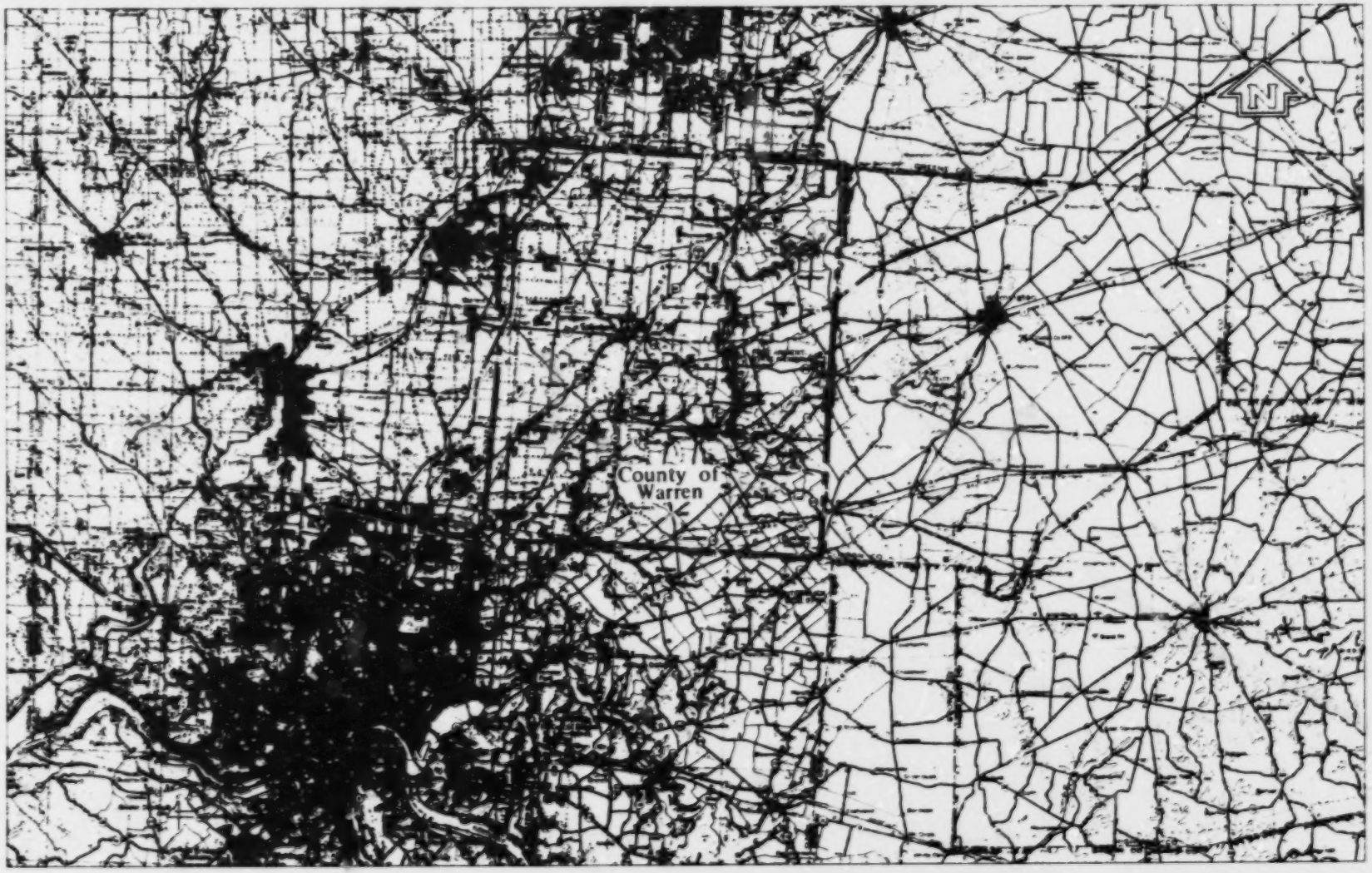

FIGURE 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

APPROXIMATE SCALE

8 0 8 16 24 MILES

VICINITY MAP

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TABLE 1: FLOODING SOURCES

FLOODING SOURCE	DESCRIPTION OF STUDY LIMITS	
	FROM	TO
DETAILED FLOODING SOURCES		
Great Miami River	County boundary	Franklin corporate limit
	Franklin corporate limit	County boundary
Little Miami River	Loveland corporate limit	Hamilton County boundary
	South Lebanon corporate limit	1.2 miles upstream
	Morrow corporate limit	0.33 mile upstream of Mill Grove Road
	0.9 mile downstream of State Route 73	State Route 73
Little Miami River Mill Run Channel	Mouth	1.6 miles upstream
Twin Creek	Confluence with Great Miami River	County boundary
Twin Creek No. 2	Confluence with Clear Creek	Springboro corporate limit
	Springboro corporate limit	County boundary
Clear Creek	Franklin corporate limit	State Route 123
	Franklin corporate limit	Springboro corporate limit
	Springboro corporate limit	Lower Springboro Road
Tommys Run	Mouth	Decker Road
Sharts Branch	Mouth	0.32 mile upstream
Gander Run	Mouth	Beal Road

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TABLE 1: FLOODING SOURCES (Continued)

FLOODING SOURCE	DESCRIPTION OF STUDY LIMITS	
	FROM	TO
DETAILED FLOODING SOURCES		
Turtle Creek	Confluence with Little Miami River	9.5 miles upstream
	State Route 48	Lebanon corporate limit
	Lebanon corporate limit	0.9 mile upstream of Wilmington Road
North Fork	Lebanon corporate limit	State Route 122
Dry Run	South Lebanon corporate limit	Bee Run
Dry Run Branch	South Lebanon corporate limit	Interstate Highway 71
Richards Run	Mouth	Lytle-Five Points Road
Coon Creek	Mouth	0.39 mile upstream
Rapid Run	Mouth	Lytle-Five Points Road
Dicks Creek	Monroe corporate limit	Robinson Vail Road
North Branch Dicks Creek	County boundary	Interstate Highway 75

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TABLE 1: FLOODING SOURCES (Continued)

FLOODING SOURCE	DESCRIPTION OF STUDY LIMITS FROM	TO
DETAILED FLOODING SOURCES		
Muddy Creek	Mason corporate limit	Mason corporate limit
Muddy Creek Branch No. 1	Mason corporate limit	0.05 mile upstream of Mason corporate limit
Muddy Creek Branch No. 2	0.58 mile upstream of mouth	County boundary
Little Muddy Creek	Mouth	Brewer Road
Little Muddy Creek Branch No. 1	1.25 miles upstream of mouth	Bethany Road
Mulfords Run	Mouth	0.71 mile upstream of State Route 63
Reeders Run	State Route 63	1.31 mile upstream of Greentree Road
Todd Fork	Confluence of First Creek	State Route 350
Pine Run	Mason corporate limit	Mason Montgomery Road
Lake Chetac Creek	Fields-Ertel Road	0.6 mile upstream of Lake Chetac Dam

TABLE 1: FLOODING SOURCES (Continued)

FLOODING SOURCE	DESCRIPTION OF STUDY LIMITS	
	FROM	TO
DETAILED FLOODING SOURCES		
Polk Run	Fields-Ertel Road	0.3 mile upstream of Snider Road
Simpson Creek	Columbia Road	Interstate Highway 71
Bear Run	0.24 mile upstream of mouth	State Route 48

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area ranges from 40 inches per year in the northwest to 43 inches in the eastern part of the county, with most of the total precipitation occurring during the winter and spring seasons (Reference 2).

Warren County has a gentle to steep rolling topography and has nine major soils, the most predominant one being the Russell-Xenia. It is a well-drained soil on long, gentle to steep slopes. The surface and subsoils are very silty and the soils are leached to a somewhat greater depth than the Miami-Celina soils which are in the upper reaches of the Great Miami River. They are moderately productive. Erosion control practices, such as terracing and contour strip cropping and a good crop rotation are needed in this area (Reference 3). The vegetation covering the unincorporated areas of Warren County varies from normal residential coverage including pasture on the rolling highlands interspersed with wooded areas, to heavily wooded areas on the steep slopes of the larger streams such as the Little Miami River and Todd Fork.

Warren County lies on the dividing line between the Great Miami River and Little Miami River watersheds. The Great Miami River flows northeast to southwest through the northwest corner from Montgomery County to Butler County. It then flows southwestwardly, through Butler County and Hamilton County, to its confluence with the Ohio River, near the Ohio-Indiana border. The Little Miami River enters at the northeast corner of the county from Greene County, then flows south and west through Warren County to Hamilton County southwestwardly to its confluence with the Ohio River east of Cincinnati. Most of the streams studied in detail in this report lie between the Great Miami River and the Little Miami River.

Residential and industrial development within the flood plain occurs in many areas. Reaches of Twin Creek near Franklin, Clear Creek, Dicks Creek, North Branch Dicks Creek, Turtle Creek, and North Fork are areas of flood plain development.

2.3 Principal Flood Problems

Low-lying areas of Warren County are subject to periodic flooding caused by overflow of the streams in the county. The Little Miami River basin is subject to two distinct types of storms which are characteristic of the area. One type is the highly localized, convectional thunderstorm which usually occurs between late spring and fall, often with intense rainfall which may produce flash floods over rather limited areas. The other is a prolonged single storm, or the summation of a series of closely spaced individual storms, usually occurring in winter or spring over relatively large areas (Reference 2).

Evidence of the highly localized storm occurred in June 1974 when both Turtle Creek and Dry Run reached flood levels in the vicinity of a 500-year frequency at Lebanon (Reference 4). The same storm produced a flood of

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less than a 10-year frequency on the Little Miami River near South Lebanon. Most of the damage occurred in the incorporated areas of the county.

The largest floods of record for the Little Miami River were in March 1913 and January 1959. Both were caused by prolonged storms. Although the 1913 flood was the flood of record for the Great Miami River, the 1959 flood on the Little Miami River exceeded the 1913 flood in the reach from Fort Ancient to the mouth of Todd Fork at Morrow. Damage was locally severe but was confined to the small communities located in the flood plain (Reference 2).

The Great Miami River basin is also subject to the two distinct types of storms described above. The conditions are modified, however, by the five retarding basins of the Miami Conservancy District which have the effect of reducing the flood peaks downstream from the dams. There are, however, many tributaries below the dams which are not regulated and can cause severe damage as was evidenced by the flood of January 1959 (Reference 5).

Cross divide flooding occurs between the Shaker Creek drainage area and the Little Muddy Creek drainage area. The streams lie on opposite sides of the divide of the Great Miami River and Little Miami River basins. The area is relatively flat and floodwaters from Shaker Creek will flow across the divide into Little Muddy Creek (Reference 6). This is presently an agricultural area and Shaker Creek has been studied by approximate methods only. Figures 2, 3, 4, and 5 illustrate the heights of the 100- and 500-year floods at specific locations on Dicks Creek, Twin Creek, Turtle Creek, and Todd Fork.

2.4 Flood Protection Measures

The flood of March 1913 led to enactment of the Conservancy Act by the Ohio State Legislature in February 1914. In June 1915, the Miami Conservancy District was formed with full authority to develop and construct flood control projects. By 1920, five retarding basins had been constructed. Two streams in Warren County, the Great Miami River and Twin Creek near Franklin, have their flows regulated by these retarding basins. The flood control works were designed and built to prevent recurrence of the damage caused by the great flood of March 1913.

In early 1978, the U.S. Army Corps of Engineers (COE) constructed a major flood reducing facility, Caesar Creek Reservoir (Reference 7). The lake is located on Caesar Creek in northeastern Warren County about three miles upstream from its confluence with the Little Miami River. The lake will control a drainage area of 237 square miles of the total 1,145 square miles at Loveland where the Little Miami River flows out of Warren County. Its benefits will be felt on Caesar Creek below the dam and on the Little Miami River below the confluence of Caesar Creek.

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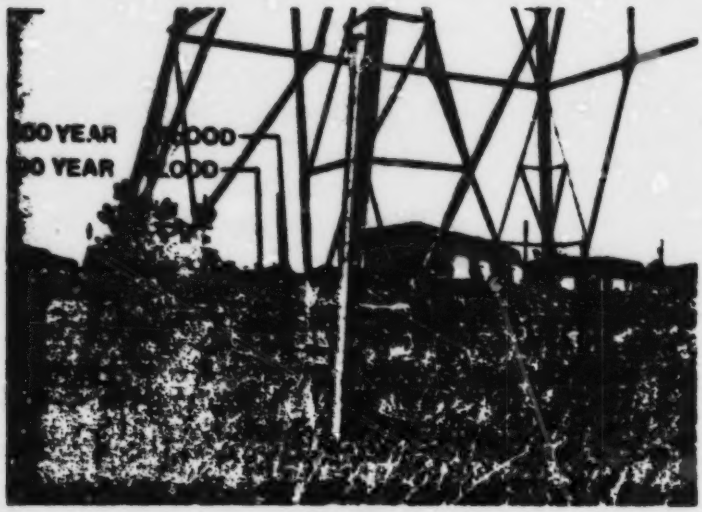

FIGURE 2 - 100- and 500-year flood heights at high tension tower at Henderson Road Bridge over Dicks Creek.

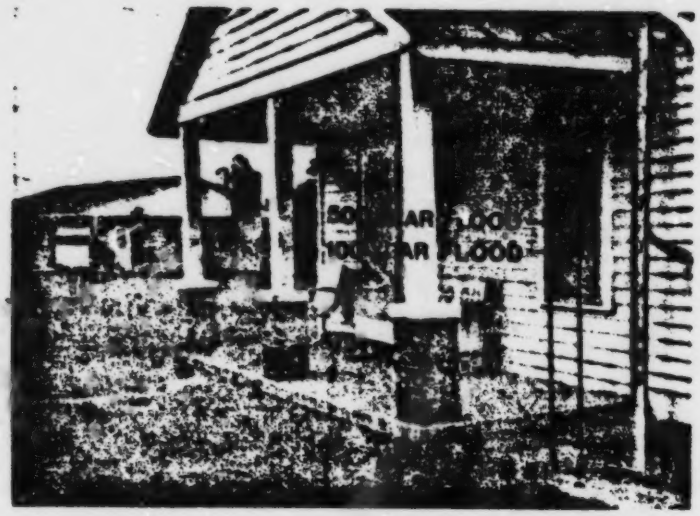

FIGURE 3 - 100- and 500-year flood heights at residence on Martz-Paulin Road, 400 feet west of Twin Creek Drive, adjacent to Twin Creek.

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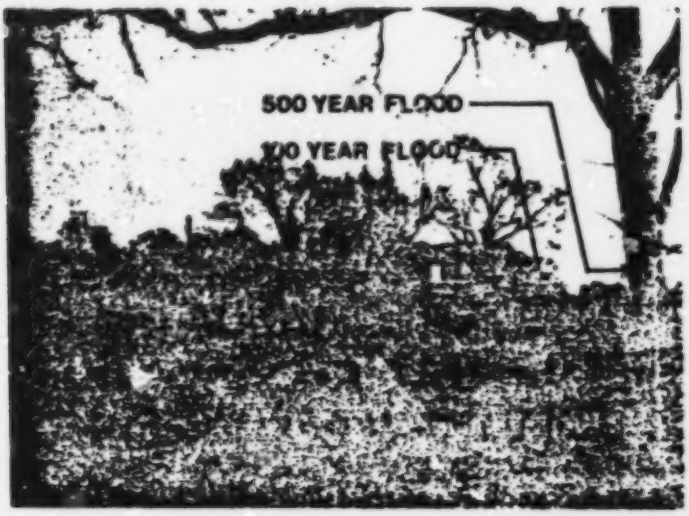

FIGURE 4 - 100- and 500-year flood heights at entrance drive to residence near Columbia Road Bridge over Turtle Creek.

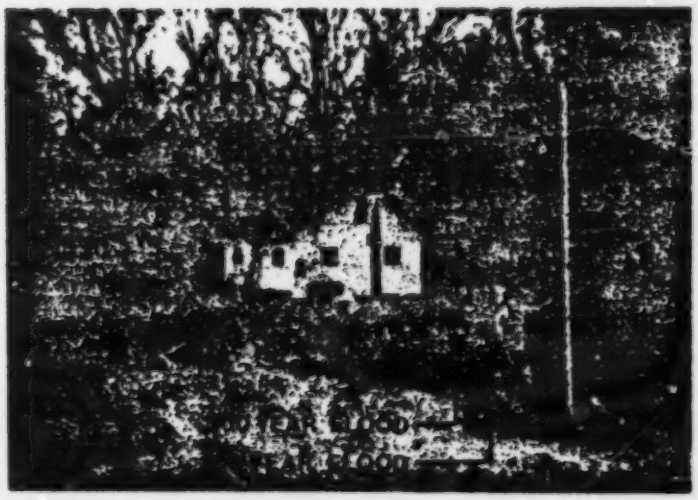

FIGURE 5 - 100- and 500-year flood heights at entrance drive to residence near Osceola-Roachester Road Bridge over Todd Fork.

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Turtle Creek, Shaker Creek, Little Muddy Creek, and Dicks Creek have small levees along portions of their banks. These levees protect against lower frequency floods, but offer no protection for floods of larger magnitudes.

Warren County has in operation at the present time a land use program which recognizes the need for flood plain regulation and controls development on the flood plains through its open space program.

3.0 ENGINEERING METHODS

For the flooding sources studied in detail in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude which are expected to be equalled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for flood plain management and for flood insurance premium rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10, 2, 1, and 0.2 percent chance, respectively, of being equalled or exceeded during any year. Although the recurrence interval represents the long term average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than one year are considered. For example, the risk of having a flood which equals or exceeds the 100-year flood (one percent chance of annual occurrence) in any 50-year period is about 40 percent (four in ten), and for any 90-year period, the risk increases to about 60 percent (six in ten). The analyses reported here reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish the peak discharge-frequency relationships for floods of the selected recurrence intervals for each flooding source studied in detail affecting the community.

Streamflow records at six gages were used for defining discharge-frequency relationships for the Great Miami River, Twin Creek near Franklin, Clear Creek, and Todd Fork. Two gages, one located at the Second Street bridge in Franklin over the Great Miami River and the other at the Union Road bridge in Franklin over Clear Creek, are operated by the Miami Conservancy District. The Great Miami River gage has been in operation since 1916 while the Clear Creek gage was operated from 1959 to 1971 (References 8, 9, and 4). The others, two on Twin Creek, one on the Great Miami River, and one on Todd Fork, are operated by the U.S. Geological Survey (USGS). The length of record for these gages is 60 years, 17 years, 40 years, and 22 years, respectively. The peak flows for the 10-, 50-, 100-, and 500-year floods were coordinated with the data developed by the Miami Conservancy

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District and the USGS using the log-Pearson Type III probability distribution method (Reference 10).

To define the discharge-frequency relationship for the ungaged streams in Warren County, methods described in Bulletin No. 32 and Bulletin No. 43, Floods In Ohio, Magnitude and Frequency, by the Ohio Department of Natural Resources, Division of Water, in cooperation with the USGS and Ohio Department of Transportation, were used (References 11 and 12). The drainage area, main channel slope, types of soils, and land use were the principal parameters used in determining a mean annual flood for each stream. Ratios of the various frequency floods to the mean annual flood were then applied to define discharge-frequency relationships. Extrapolation on log-probability paper of the ratios of the 10-, 50-, and 100-year floods obtained by the above described method were used to obtain the 500-year value. Drainage area and channel slope values were obtained from USGS topographic maps (Reference 13), and from "Drainage Areas of Ohio Streams" (Reference 14). The soils in the state have been grouped into 52 soil regions by the Division of Lands and Soils of the Ohio Department of Natural Resources (Reference 3). Coefficients are assigned to the soil types (Reference 11), and are applied to the mean annual flood calculations.

Discharge-frequency relationships for the Little Miami river were taken from the Hamilton County, South Lebanon, Morrow, and Waynesville Flood Insurance Studies (References 15, 16, 17, and 18). The discharge-frequency relationships for the Little Miami River Mill Run Channel were obtained from the Waynesville Flood Insurance Study (Reference 18); and for Muddy Creek and Muddy Creek Branch No. 1, discharge-frequency relationships were obtained from the Mason Flood Insurance Study (Reference 19).

Discharges of the 100-year flood for approximate study areas were also computed using the methods described in Bulletin No. 32 and Bulletin No. 43 (References 11 and 12). The discharges of the 100-year flood and water elevations for the approximate study area of the Little Miami River were taken directly from COE data (Reference 7).

Peak discharges for the 10-, 50-, 100-, and 500-year floods of each flooding source studied in detail in the community are shown in Table 2.

3.2 Hydraulic Analyses

Analyses of the hydraulic characteristics of the streams in the community were carried out to provide estimates of the elevations of the floods of the selected recurrence intervals along each flooding source studied in detail.

Cross section data for streams studied in detail were obtained primarily by field measurement. Some cross section information for the Great Miami River and Clear Creek were made available by the Miami River Conservancy District (References 20 and 21). Cross sections taken on Clear

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TABLE 2 - SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA SQ MILES	PEAK DISCHARGES (CFS) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
GREAT MIAMI RIVER					
County boundary	3,109	58,000	85,800	93,000	130,400
Confluence of Twin Creek	2,794	52,100	77,100	92,000	117,200
Confluence of Clear Creek	2,739	51,100	75,600	90,000	114,800
Park Avenue	2,727	50,800	75,200	86,000	114,300
LITTLE MIAMI RIVER					
Confluence of Ertel Run	1,145	45,100	68,000	82,700	110,200
South Lebanon corporate limit	969	40,300	62,300	72,900	98,800
Confluence of Todd Fork	687	23,700	38,900	47,700	71,200
LITTLE MIAMI RIVER MILL RUN CHANNEL					
State Route 73	398	21,000	35,500	43,700	66,000
TWIN CREEK					
Mouth	316	14,400	17,200	18,500	21,000
TWIN CREEK NO. 2					
Mouth	6.86	1,625	2,340	2,650	3,350
Near Springboro Road	5.46	1,350	1,975	2,240	2,975
Near State Route 73	4.1	1,100	1,580	1,800	2,250

TABLE 2 - SUMMARY OF DISCHARGES (Continued)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA SQ MILES	PEAK DISCHARGES (CFS) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
CLEAR CREEK					
0.5 mile upstream of confluence of Sharts Branch	44.23	9,100	13,000	14,700	18,600
0.3 mile downstream Weidner Road	37.59	7,800	11,100	12,500	15,800
0.1 mile upstream of confluence of Twin Creek No. 2	29.87	6,200	8,850	9,900	12,600
0.2 mile upstream of confluence of Richards Run	24.74	5,100	7,300	8,200	10,400
0.7 mile downstream of Bunnel Hill Road	17.79	3,700	5,200	5,900	7,500
Near Bunnel Hill Road	14.90	3,100	4,400	5,000	6,300
TOMMYS RUN					
0.3 mile downstream of confluence of Greens Run	3.44	1,100	1,590	1,800	2,250
0.18 mile downstream of Shaker Road	1.17	490	715	810	1,000
SHARTS BRANCH					
Mouth	1.50	340	500	540	800
GANDER RUN					
Mouth	5.38	1,500	2,200	2,480	3,100

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TABLE 2 - SUMMARY OF DISCHARGES (Continued)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA SQ MILES	PEAK DISCHARGES (CFS) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
TURTLE CREEK					
Near State Route 48	58.2	9,200	13,230	14,600	18,200
0.33 mile upstream of confluence of Little Muddy Creek	35.1	6,700	9,560	10,800	13,600
Near confluence of Reeders Run	27.7	6,000	8,750	9,700	12,700
Near Glosser Road	22.3	5,200	7,540	8,500	10,900
Near Cincinnati Avenue	11.8	3,400	4,870	5,500	6,700
NORTH FORK					
Near Lebanon corporate limit	3.15	1,050	1,525	1,725	2,125
0.67 mile upstream of Lebanon corporate limit	2.12	750	1,100	1,250	1,600
Near Hoffman Avenue	1.20	515	750	850	1,075
DRY RUN CREEK					
0.07 mile downstream of South Lebanon corporate limit	6.76	1,900	2,800	3,200	4,000
Snook Road	5.22	1,700	2,540	2,750	3,470

TABLE 2 - SUMMARY OF DISCHARGES (Continued)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA SQ MILES	PEAK DISCHARGES (CFS) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
DRY RUN BRANCH					
Mouth	0.83	600	800	1,000	1,300
RICHARDS RUN					
Mouth	4.7	1,400	2,050	2,325	2,900
Near confluence of Rapid Run	1.47	640	950	1,075	1,370
COON CREEK					
Mouth	1.9	825	1,210	1,375	1,700
RAPID RUN					
Mouth	0.7	375	565	650	825
DICKS CREEK					
Near Hendrickson Road	8.55	1,850	2,700	3,025	3,900
0.14 mile downstream of State Route 122	5.0	1,430	2,050	2,320	2,900
NORTH BRANCH DICKS CREEK					
Near Cincinnati Dayton Road	2.48	800	1,150	1,300	1,650

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TABLE 2 - SUMMARY OF DISCHARGES (Continued)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA SQ MILES	PEAK DISCHARGES (CFS) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
MUDDY CREEK					
Above Conrail	2.92	790	1,150	1,300	1,600
Tradewind Drive	1.71	535	780	890	1,100
MUDDY CREEK BRANCH NO. 1					
Confluence with Muddy Creek	0.91	425	625	710	880
Mason-Montgomery Road	0.48	245	360	410	500
MUDDY CREEK BRANCH NO. 2					
Mason corporate limit	1.08	410	595	675	835
LITTLE MUDDY CREEK					
0.23 mile upstream of confluence with Turtle Creek	21.23	2,375	3,380	3,800	4,700
0.2 mile upstream of confluence of Little Muddy Creek Branch No. 1	10.45	1,275	1,600	2,050	2,600
0.33 mile downstream of Kyles Station-Hamilton Road	7.61	1,080	1,540	1,740	2,150

TABLE 2 - SUMMARY OF DISCHARGES (Continued)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA SQ MILES	PEAK DISCHARGES (CFS) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
LITTLE MUDDY CREEK BRANCH NO. 1					
1.36 miles upstream of mouth	1.43	420	615	695	900
MULFORDS RUN					
Mouth	1.41	650	960	1,125	1,425
REEDERS RUN					
Mouth	5.06	1,550	2,250	2,550	3,250
Upstream of Greentree Road	3.04	1,050	1,530	1,730	2,250
Downstream of dam	2.11	800	1,160	1,320	1,700
TODD FORK					
Near Morrow corporate limit	242	20,600	27,840	30,700	38,800
0.14 mile downstream of State Route 123	219	19,590	26,480	29,200	35,150
0.52 mile downstream of Conrail	204	18,900	25,560	28,190	33,925
Near State Route 350	147	16,050	21,700	23,930	28,800
PINE RUN					
Mason corporate limit	0.67	290	430	490	600

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TABLE 2 - SUMMARY OF DISCHARGES (Continued)

FLOODING SOURCE AND LOCATION	DRAINAGE AREA SQ MILES	PEAK DISCHARGES (CFS) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
LAKE CHETAC CREEK					
Fields-Ertel Road	0.93	390	570	645	800
0.26 mile upstream of Lake Chetac Dam	0.48	230	340	380	480
POLK RUN					
Fields-Ertel Road	1.61	760	1,100	1,280	1,625
Near Irwin Simpson Road	0.7	420	620	700	950
SIMPSON CREEK					
Columbia Road	3.06	950	1,400	1,600	2,000
BEAR RUN					
State Route 3	5.75	2,300	3,340	3,750	4,700
0.18 mile upstream of State Route 3	4.02	1,700	2,450	2,750	3,470
0.27 mile upstream of Hopkins Road	2.92	1,440	2,145	2,450	3,075

Creek, Twin Creek, and Dicks Creek by the Soil Conservation Service (SCS) were also made available and utilized (Reference 22). Bridge data from the Ohio Department of Transportation were utilized where available, and all other bridges and culverts were surveyed to obtain elevations, clearances, and other structural geometry.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross section locations are also shown on the Flood Boundary and Floodway Map (Exhibit 2).

Roughness coefficients (Manning's "n" values) for stream channels and overbanks were estimated by field inspection at each cross section. Coefficients ranged from 0.035 to 0.055 for channels and from 0.04 to 1.12 for overbanks.

The hydraulic analysis for the Little Miami River was taken from the Hamilton County, South Lebanon, Morrow, and Waynesville Flood Insurance Studies (References 15, 16, 17, and 18). The hydraulic analysis for the Little Miami River Mill Run Channel was taken from the Waynesville Flood Insurance Study (Reference 18). The hydraulic analysis for Muddy Creek and Muddy Creek Branch No. 1 were taken from the Mason Flood Insurance Study (Reference 19).

Starting water-surface elevations were obtained from discharge rating curves on the Great Miami River. Starting water-surface elevations for Clear Creek and Sharts Branch were obtained from the Franklin Flood Insurance Study (Reference 23). Starting water-surface elevations for Reeders Run were obtained from the Lebanon Flood Insurance Study (Reference 24). Starting water-surface elevations for North Fork, Dry Run Creek, and Dry Run Branch were obtained from the South Lebanon Flood Insurance Study (Reference 16). Starting water-surface elevations for Todd Fork were obtained from the Morrow Flood Insurance Study (Reference 17). Starting water-surface elevations for Muddy Creek Branch No. 2 and Pine Run were obtained from the Mason Flood Insurance Study (Reference 19). Starting water-surface elevations for the remaining detailed flooding sources were obtained from the slope-area method.

Water-surface profiles were developed from the hydrologic data discussed above and the cross section information using a HEC-2 computer step-backwater model (Reference 25). Flood profiles were drawn showing computed water-surface elevations to an accuracy of 0.5 foot for floods of the selected recurrence intervals (Exhibit 1). These were compared with profiles of known floods (References 7, 26, and 27), and roughness coefficients were revised where necessary to obtain proper correlation between computed and observed profiles.

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Little Miami River backwater elevations shown on Turtle Creek and Bear Run are based on the Caesar Creek Reservoir dam and its effect on the Little Miami River profiles (Reference 7).

Water depths for streams studied by approximate methods were obtained by correlating their discharge and profile characteristics with similar streams of known depth.

The hydraulic analyses for this study are based only on the effects of unobstructed flow. The flood elevations as shown on the profiles are, therefore, considered valid only if hydraulic structures, in general, remain unobstructed and if channel and overbank conditions remain essentially the same as ascertained during this study.

All elevations are referenced from National Geodetic Vertical Datum of 1929 (NGVD); elevation reference marks used in the study are shown on the maps.

4.0 FLOOD PLAIN MANAGEMENT APPLICATIONS

The National Flood Insurance Program encourages state and local governments to adopt sound flood plain management programs. Therefore, each Flood Insurance Study includes a flood boundary map designed to assist communities in developing sound flood plain management measures.

4.1 Flood Boundaries

In order to provide a national standard without regional discrimination, the 100-year flood has been adopted by the FIA as the base flood for purposes of flood plain management measures. The 500-year flood is employed to indicate additional areas of flood risk in the community. For each stream studied in detail, the boundaries of the 100-year and the 500-year floods have been delineated using the elevations determined at each cross section; between cross sections the boundaries were interpolated using topographic maps enlarged to a scale of 1:9600, with a contour interval of 10 feet (Reference 13). In approximate areas, cross sections were not available and the 100-year flood limits were plotted using the above-mentioned topographic maps. Flood boundaries for the Little Miami River 100-year storm were obtained from COE data (Reference 7). Approximate boundaries for the Caesar Creek Reservoir area were taken from the Flood Hazard Boundary Map (Reference 28).

The boundaries of the 100- and 500-year floods are shown on the Flood Boundary and Floodway Map (Exhibit 2). Small areas within the flood boundaries may lie above the flood elevations and, therefore, not be subject to flooding; owing to lack of detailed topographical information or to limitations of the map scale, such areas are not shown. In cases where the 100-year and the 500-year flood boundaries are close together, only the 100-year boundary has been shown.

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4.2 Floodways

Encroachment on flood plains, such as artificial fill, reduces the flood-carrying capacity, increases the flood heights of streams, and increases flood hazards in areas beyond the encroachment itself. One aspect of flood plain management involves balancing the economic gain from flood plain development against the resulting increase in flood hazard. For purposes of the National Flood Insurance Program, the concept of a floodway is used as a tool to assist local communities in this aspect of flood plain management. Under this concept, the area of the 100-year flood is divided into a floodway and a floodway fringe. The floodway is the channel of a stream plus any adjacent flood plain areas that must be kept free of encroachment in order that the 100-year flood may be carried without substantial increases in flood heights. Minimum standards of the FIA limit such increases in flood heights to 1.0 foot, provided that hazardous velocities are not produced.

The floodway recommended for this study was computed on the basis of equal conveyance reduction from each side of the flood plain. The result of these computations were tabulated at selected cross sections for each stream segment for which a floodway was computed (Table 3). The floodway along the branches was computed on the basis of equal conveyance reduction without consideration of backwater flooding from the receiving stream. Floodway surcharge elevations along the lower reaches of the branches, therefore, are below rather than above the 100-year elevations as determined by the receiving stream backwater. Floodway data for the Little Miami River were taken from the Hamilton County, South Lebanon, Morrow, and Waynesville Flood Insurance Studies (References 15, 16, 17, and 18). Data for the Little Miami River Mill Run Channel were taken from the Waynesville Flood Insurance Study (Reference 18). Data for a portion of Dry Run Creek were obtained from the South Lebanon Flood Insurance Study (Reference 16). Floodway data for Muddy Creek and Muddy Creek Branch No. 1 were taken from the Mason Flood Insurance Study (Reference 19).

No floodway is shown on either Turtle Creek from State Route 48 downstream to its mouth at the Little Miami River or the Little Miami River from State Route 148 upstream to the South Lebanon corporate limits because the flood elevations as shown in this area were determined from the contiguous community of South Lebanon, Ohio, rather than from a detailed study (Reference 16).

As shown on the Flood Boundary and Floodway Map (Exhibit 2), the floodway boundaries were determined at cross sections; between cross sections, the boundaries were interpolated. In cases where the boundaries of the floodway and the 100-year flood are either close together or collinear, only the floodway boundary has been shown.

The area between the floodway and the boundary of the 100-year flood is termed the floodway fringe. The floodway fringe thus encompasses the portion of the flood plain that could be completely obstructed without increasing the water-surface elevation of the 100-year flood more than 1.0 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to flood plain development are shown in Figure 6.

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FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
GREAT MIAMI RIVER								
A	56.13	2200[2]	24,675	3.77	663.3	663.3	663.6	0.3
B	56.32	1912[2]	20,360	4.57	663.7	663.7	664.0	0.3
C	56.53	1410[2]	15,614	5.96	664.3	664.3	664.7	0.4
D	56.71	763[2]	13,598	6.77	665.1	665.1	665.6	0.5
E	56.72	763[2]	13,663	6.73	665.3	665.3	665.8	0.5
F	56.82	898[2]	11,302	8.14	665.5	665.5	666.0	0.5
G	56.98	1050[2]	9908	9.29	666.3	666.3	666.5	0.2
H	57.17	904[2]	9359	9.83	667.8	667.8	668.1	0.3
I	57.43	1783[2]	16,933	5.43	669.9	669.9	670.5	0.6
J	57.87	1381[3]	15,216	5.91	671.7	671.7	672.2	0.5
K	60.22	2419[4]	25,456	3.38	681.5	681.5	682.2	0.7
L	60.41	1834[4]	18,143	4.74	681.8	681.8	682.4	0.6
M	60.60	1638[3]	16,148	5.33	682.2	682.2	682.8	0.6
N	60.73	1322[3]	15,878	5.42	682.7	682.7	683.4	0.7
O	61.05	1283[3]	16,415	5.24	683.6	683.6	684.2	0.6
P	61.19	852	13,025	6.60	683.8	683.8	684.4	0.6
Q	61.60	697	10,553	8.15	686.2	686.2	686.8	0.6
R	61.69	1063	9348	9.20	686.8	686.8	687.4	0.6
S	61.82	379	7423	11.60	688.7	688.7	688.7	0.0

[1]MILES ABOVE CONFLUENCE WITH OHIO RIVER
[2]THIS WIDTH EXTENDS BEYOND COUNTY BOUNDARY
[3]THIS WIDTH EXTENDS WITHIN CITY OF FRANKLIN
[4]THIS WIDTH EXTENDS WITHIN CITY OF FRANKLIN AND VILLAGE OF CARLISLE

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

FLOODWAY DATA

GREAT MIAMI RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	REGULATORY (FEET NGVD)	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY (FEET NGVD)	INCREASE (FEET)
LITTLE MIAMI RIVER								
A	24.60	408[2]	9200	8.6	592.7	592.7	593.6	0.9
B	25.65	487	10,545	7.5	597.0	597.0	597.9	0.9
C	26.95	302	8165	9.7	601.9	601.9	602.7	0.8
D	28.40	505	9495	8.2	608.2	608.2	609.0	0.8
E	29.30	579	12 540	6.2	611.8	611.8	612.8	1.0
F	30.30	530	10,706	7.2	614.9	614.9	615.8	0.9
G	30.90	546	11,173	6.9	617.7	617.7	618.6	0.9
H	31.00	582	12,255	6.3	618.5	618.5	619.2	0.7
I	31.70	439	9818	7.9	620.6	620.6	621.4	0.8
J	32.30	351	9287	8.3	622.9	622.9	623.7	0.8
K	32.60	370	8929	8.5	624.1	624.1	624.9	0.8
L	33.22	721	15,315	5.0	626.6	626.6	627.5	0.9
M	34.50	691	13,290	5.5	632.7	632.7	633.4	0.7
N	35.45	668	11,824	6.2	637.1	637.1	637.8	0.7
O	36.25	673	11,696	6.2	640.6	640.6	641.3	0.7
P	37.15	440	8786	8.3	644.1	644.1	644.8	0.7
Q	37.85	971	13,807	5.3	647.3	647.3	648.1	0.8
R	38.90	733[3]	12,007	6.0	651.0	651.0	651.9	0.9
S	39.80	393	6015	7.9	653.6	653.6	654.4	0.8
T	40.85	519	7572	6.3	658.9	658.9	659.3	0.4
U	41.90	401	5068	9.4	662.2	662.2	662.9	0.7
V	42.55	485	5981	7.9	666.4	666.4	667.2	0.8
W	43.00	292	4387	10.7	668.8	668.8	669.7	0.9
X	43.27	281	4314	10.9	671.0	671.0	671.7	0.7
Y	43.90	352	6141	7.7	675.3	675.3	675.7	0.4
Z	44.30	310	4390	10.7	676.5	676.5	676.9	0.4

[1]MILES ABOVE MOUTH
[2]THIS WIDTH EXTENDS BEYOND COUNTY BOUNDARY
[3]THIS WIDTH EXTENDS WITHIN VILLAGE OF MORROW

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TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

FLOODWAY DATA

LITTLE MIAMI RIVER

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FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	REGULATORY (FEET NGVD)	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY (FEET NGVD)	INCREASE (FEET)
LITTLE MIAMI RIVER								
AA	44.50	430	6164	7.6	679.8	679.8	680.3	0.5
AB	44.86	236	4467	10.5	680.8	680.8	681.4	0.6
AC	45.30	332	5506	8.5	683.3	683.3	684.0	0.7
AD	45.80	1021	10,201	4.6	685.5	685.5	686.5	1.0
AE	46.40	461	8074	5.8	686.6	686.6	687.6	1.0
AF	46.60	397	7720	6.0	687.6	687.6	688.4	0.8
AG	47.27	640	7129	6.5	689.1	689.1	689.9	0.8
AH	48.30	764	8064	5.8	693.1	693.1	693.9	0.8
AI	48.80	680	8880	5.2	694.8	694.8	695.6	0.8
AJ	48.90	501	6083	7.6	696.0	696.0	696.6	0.6
AK	50.00	640	10,228	4.5	699.9	699.9	700.7	0.8
AL	50.97	1001	10,965	4.2	702.4	702.4	703.1	0.7
AM	51.65	959	7546	6.1	705.6	705.6	706.2	0.6
AN	52.15	828	7738	5.7	708.8	708.8	709.6	0.8
AO	52.92	971	7919	5.6	712.5	712.5	713.3	0.8
AP	53.70	1011	9129	4.8	716.2	716.2	717.0	0.8
AQ	54.15	1194	10,465	4.2	720.8	720.8	721.7	0.9
AR	54.71	866[2]	9422	4.6	721.9	721.9	722.8	0.9
AS	54.92	931[2]	10,513	4.2	723.8	723.8	724.7	0.9
AT[4]	55.30	1621[3]	18,611	2.3	724.5	724.5	725.4	0.9
AU[4]	55.90	1979	12,327	3.5	725.0	725.0	725.9	0.9
AV	56.50	1309	9716	4.4	726.9	726.9	727.4	0.5
AW	57.45	1695	17,919	2.4	729.4	729.4	730.2	0.8
AX	57.85	1707	18,565	2.3	729.7	729.7	730.5	0.8
AY	59.10	1273	9191	4.6	731.8	731.8	732.6	0.8
AZ	59.55	1338	9848	4.2	734.7	734.7	735.6	0.9

[1]MILES ABOVE MOUTH
[2]THIS WIDTH EXTENDS WITHIN VILLAGE OF WAYNESVILLE
[3]THIS WIDTH EXTENDS WITHIN VILLAGE OF WAYNESVILLE AND VILLAGE OF CORWIN
[4]LOCATED ALONG LITTLE MIAMI RIVER-MILL RUN CHANNEL

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TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

FLOODWAY DATA

LITTLE MIAMI RIVER

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	REGULATORY (FEET NGVD)	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY (FEET NGVD)	INCREASE (FEET)
LITTLE MIAMI RIVER								
BA	59.70	1791	17,576	2.4	737.4	737.4	738.4	1.0
BB	60.38	1059	7587	5.5	739.1	739.1	739.9	0.8
BC	60.85	695	7632	5.4	742.4	742.4	743.2	0.8
TWIN CREEK								
A	0.83	997	6336	2.9	667.4	667.4	668.4	1.0
B	1.46	411	3982	4.6	672.8	672.8	673.7	0.9
C	1.52	411	3606	5.1	674.0	674.0	674.8	0.8
D	1.98	1221	11,198	1.7	676.7	676.7	677.6	0.9
E	2.32	849	6318	2.9	677.9	677.9	678.8	0.9
F	2.74	632/132[2]	4906	3.8	681.6	681.6	682.6	1.0
G	3.12	865/685[2]	6990	2.6	684.3	684.3	685.3	1.0
H	3.25	539/469[2]	3614	5.1	685.0	685.0	685.9	0.9
I	3.29	634/ 44[2]	4424	4.2	685.6	685.6	686.5	0.9
J	3.66	896	7131	2.6	688.7	688.7	689.7	1.0
TWIN CREEK NO. 2								
A	0.47	139[3]	449	5.0	748.0	748.0	748.0	0.0
B	0.72	169[3]	1055	2.1	753.2	753.2	753.7	0.5
C	0.73	148[3]	631	3.6	753.2	753.2	753.7	0.5
D	0.90	44	198	11.3	755.8	755.8	755.8	0.0
E	0.99	40	282	7.9	762.3	762.3	762.3	0.0
F	3.66	92	279	6.5	888.9	888.9	889.3	0.4

[1] MILES ABOVE MOUTH
[2] TOTAL WIDTH/WIDTH WITHIN COUNTY BOUNDARY
[3] THIS WIDTH EXTENDS WITHIN VILLAGE OF SPRINGBORO

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TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

FLOODWAY DATA

LITTLE MIAMI RIVER—TWIN CREEK—TWIN CREEK NO. 2

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FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
CLEAR CREEK								
A	1.27	202	2561	6.60	681.1	681.1	681.5	0.4
B	1.68	168	2415	7.00	683.7	683.7	684.2	0.5
C	1.71	222	2414	7.00	684.0	684.0	684.5	0.5
D	2.11	328[3]	2219	7.03	689.5	689.5	690.0	0.5
E	4.25	842[4]	5876	2.50	709.6	709.6	710.2	0.6
F	4.66	404[4]	2480	5.93	712.0	712.0	712.5	0.5
G	5.34	712[4]	3969	3.70	719.8	719.8	720.3	0.5
H	5.83	619	2685	5.47	725.4	725.4	725.9	0.5
I	6.45	272	2134	5.86	737.9	737.9	738.4	0.5
J	6.78	86	1257	9.94	739.7	739.7	740.3	0.6
K	6.82	438	4926	2.54	742.4	742.4	742.9	0.5
L	7.12	749[5]	5800	1.71	742.9	742.9	743.4	0.5
M	7.82	719	2513	3.26	749.6	749.6	750.1	0.5
N	8.33	828	3352	2.45	752.9	752.9	754.3	0.5
O	8.52	160	1716	4.78	758.4	758.4	758.9	0.5
P	8.85	585	2387	3.44	759.6	759.6	760.1	0.5
Q	9.28	622	1246	4.74	765.0	765.0	765.5	0.5
R	9.65	355	1565	3.77	771.9	771.9	772.4	0.5
S	9.96	106	796	6.28	777.5	777.5	778.0	0.5
T	9.98	127	834	6.00	778.2	778.2	778.5	0.3
U	10.57	70	478	10.46	793.7	793.7	794.3	0.6
TOMMYS RUN								
A	0.25[2]	59	263	6.84	685.7	685.2[6]	685.7	0.5
B	0.84[2]	32	176	4.60	727.7	727.7	727.9	0.2
C	0.95[2]	103	600	1.35	740.2	740.2	740.3	0.1
D	1.01[2]	56	380	2.13	741.5	741.5	741.6	0.1
E	1.26[2]	42	207	3.91	749.5	749.5	749.5	0.0

[1]MILES ABOVE CONFLUENCE WITH GREAT MIAMI RIVER
[2]MILES ABOVE MOUTH
[3]THIS WIDTH IS WITHIN CITY OF FRANKLIN
[4]THIS WIDTH EXTENDS WITHIN CITY OF FRANKLIN
[5]THIS WIDTH IS WITHIN VILLAGE OF SPRINGBORO
[6]ELEVATIONS WITHOUT CONSIDERING BACKWATER EFFECT FROM CLEAR CREEK

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

FLOODWAY DATA

CLEAR CREEK - TOMMYS RUN

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
SHARTS BRANCH								
A	0.24	33	81	6.79	705.2	705.2	705.7	0.5
GANDER RUN								
A	0.20	141	520	4.77	727.5	727.5	728.2	0.7
TURTLE CREEK								
A	0.46[2]	137	1531	9.54	627.4	625.3[3]	625.8	0.5
B	0.54[2]	308	2828	5.16	627.4	627.3[3]	627.5	0.2
C	0.66[2]	81	1626	8.98	633.5	633.5	633.9	0.4
D	0.68[2]	428	6007	2.43	634.8	634.8	635.2	0.4
E	0.81[2]	521	5811	2.51	634.9	634.9	635.4	0.5
F	1.04[2]	237	3019	4.84	635.2	635.2	635.6	0.4
G	1.29[2]	183	1906	7.68	636.4	636.4	636.9	0.5
H	1.33[2]	164	1556	9.38	636.8	636.8	637.1	0.3
I	1.76[2]	219	2311	6.32	644.0	644.0	644.4	0.4
J	2.03[2]	279	2312	6.31	647.1	647.1	647.6	0.5
K	2.31[2]	174	1720	8.49	650.1	650.1	650.5	0.4
L	2.53[2]	80	1287	11.34	652.8	652.8	653.4	0.6
M	2.55[2]	311	2783	5.28	654.6	654.6	655.1	0.5
N	2.69[2]	139	1739	8.40	655.2	655.2	655.6	0.4
O	3.07[2]	195	2195	4.92	657.9	657.9	658.4	0.5
P	3.55[2]	288	2613	4.13	660.1	660.1	660.6	0.5
Q	3.30[2]	113	1377	7.84	664.0	664.0	664.4	0.4
R	3.83[2]	327	3659	2.95	664.9	664.9	665.5	0.6
S	4.03[2]	126	1604	6.73	665.2	665.3	665.8	0.5
T	4.23[2]	143	1740	6.21	667.4	667.4	667.8	0.4
U	4.35[2]	174	1997	5.41	668.5	668.5	669.0	0.5
V	4.39[2]	151	1741	6.20	668.9	668.9	669.4	0.5

[1]MILES ABOVE MOUTH
[2]MILES ABOVE CONFLUENCE WITH LITTLE MIAMI RIVER
[3]ELEVATIONS WITHOUT CONSIDERING BACKWATER EFFECT FROM LITTLE MIAMI RIVER

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

FLOODWAY DATA

SHARTS BRANCH - GANDER RUN - TURTLE CREEK

BEST COPY AVAILABLE

BEST COPY AVAILABLE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
TURTLE CREEK								
W	4.43	84	1338	8.08	669.0	669.0	669.4	0.4
X	4.69	841	5840	1.85	670.6	670.6	671.0	0.4
Y	4.84	177	2175	4.97	671.8	671.8	672.2	0.4
Z	4.86	761	6349	1.82	672.2	672.2	672.6	0.4
AA	5.30	230	2153	5.02	672.7	672.7	673.1	0.4
AB	8.09	69	719	7.65	720.7	720.7	720.7	0.0
AC	8.15	55	925	5.95	721.4	721.4	721.4	0.0
AD	8.36	221	2743	2.01	728.6	728.6	728.6	0.0
AE	8.45	104	1179	4.66	729.1	729.1	729.1	0.0
AF	8.59	204	2133	2.58	729.9	729.9	729.9	0.0
AG	8.73	229	1669	3.30	730.3	730.3	730.3	0.0
AH	9.20	74	669	8.22	736.7	736.7	737.0	0.3
NORTH FORK								
A	2.50[2]	77	345	5.00	813.0	813.0	813.5	0.5
B	2.67[2]	83	255	6.76	818.6	818.6	818.7	0.1
C	3.19[2]	49	170	7.35	838.6	838.6	838.6	0.0
D	3.49[2]	36	198	6.28	854.2	854.2	854.7	0.5
E	3.50[2]	47	207	6.04	854.5	854.5	855.0	0.5
F	3.60[2]	27	160	7.81	859.5	859.5	860.2	0.7
G	3.61[2]	48	233	5.36	860.5	860.5	860.8	0.3
H	3.81[2]	14	112	11.16	871.2	871.2	871.2	0.0
I	3.82[2]	71	477	2.62	873.2	873.2	873.2	0.0
J	4.15[2]	16	94	9.04	888.9	888.9	888.9	0.0
K	4.16[2]	42	96	8.85	889.5	889.5	889.5	0.0
L	4.59[2]	36	122	6.97	911.2	911.2	911.5	0.3

[1]MILES ABOVE CONFLUENCE WITH LITTLE MIAMI RIVER
[2]MILES ABOVE CONFLUENCE WITH TURTLE CREEK

TABLE 3

FEDEPAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

FLOODWAY DATA

TURTLE CREEK - NORTH FORK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
DRY RUN								
A	0.92	44[2]	337	9.50	637.7	637.7	638.0	0.3
B	1.34	80	544	5.88	652.3	652.3	652.7	0.4
C	1.56	339	1313	2.44	657.2	657.2	657.5	0.3
D	1.81	56	347	7.93	662.0	662.0	662.6	0.6
E	1.82	75	355	7.75	663.1	663.1	663.1	0.0
F	2.03	177	566	4.86	669.0	669.0	669.3	0.3
G	2.17	110	813	3.38	675.0	675.0	675.3	0.3
H	2.18	62	630	4.37	676.8	676.8	677.2	0.4
I	2.41	54	232	11.85	678.9	678.9	678.9	0.0
DRY RUN BRANCH								
A	0.02	29	109	9.17	633.7	633.7	633.7	0.0
B	0.21	42	101	9.91	648.7	648.7	648.7	0.0
RICHARDS RUN								
A	0.32	233	770	3.02	749.2	749.2	749.7	0.5
B	0.86	75	246	9.45	766.7	766.7	766.9	0.2
C	1.07	222	1393	1.67	779.1	779.1	779.4	0.3
D	1.35	101	280	8.30	784.6	784.6	785.0	0.4
E	1.60	79	305	3.52	797.9	797.9	798.4	0.5
F	1.84	36	108	9.95	813.3	813.3	813.3	0.0
G	2.16	35	168	6.40	844.5	844.5	844.6	0.1
H	2.51	48	174	6.18	864.5	864.5	865.0	0.5
I	2.66	28	110	9.77	876.7	876.7	877.1	0.4

[1]MILES ABOVE MOUTH
[2]THIS WIDTH EXTENDS WITHIN VILLAGE OF SOUTH LEBANON

BEST COPY AVAILABLE

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

FLOODWAY DATA

DRY RUN - DRY RUN BRANCH - RICHARDS RUN

BEST COPY AVAILABLE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
COON CREEK								
A	0.06	48	202	6.18	792.4	792.4	792.9	0.5
B	0.39	53	192	7.16	809.2	809.2	809.4	0.2
RAPID RUN								
A	0.08	34	103	6.31	793.4	793.4	793.9	0.5
B	0.40	54	89	7.30	820.3	820.3	820.5	0.2
C	0.69	37	134	4.85	853.6	853.6	854.2	0.6
D	1.00	32	109	5.96	872.8	872.8	872.8	0.0
E	1.15	164	907	0.72	891.5	891.5	891.5	0.0
F	1.16	107	437	1.49	891.5	891.5	891.5	0.0
G	1.35	29	72	9.03	902.5	902.5	902.5	0.0
DICKS CREEK								
A	6.75[2]	220	1233	2.45	673.8	673.8	674.4	0.6
B	6.76[2]	223	1300	2.33	673.8	673.8	674.4	0.6
C	7.27[2]	143	365	8.29	680.2	680.2	680.4	0.2
D	7.59[2]	323	1047	2.89	688.7	688.7	689.3	0.6
E	7.98[2]	66	536	4.33	699.6	699.6	700.4	0.8
F	7.99[2]	59	395	5.87	699.7	699.7	700.4	0.7
G	8.16[2]	62	443	5.24	705.6	705.6	706.4	0.8
H	8.18[2]	153	1058	2.19	706.4	706.4	707.0	0.6
I	8.56[2]	56	349	6.65	725.2	725.2	725.9	0.7
J	8.96[2]	162	652	3.55	737.5	737.5	737.9	0.4

[1]MILES ABOVE MOUTH
[2]MILES ABOVE CONFLUENCE WITH GREAT MIAMI RIVER

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

FLOODWAY DATA

COON CREEK - RAPID RUN - DICKS CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
DICKS CREEK								
K	9.39	57	242	9.59	753.4	753.4	753.9	0.5
L	9.73	221	640	3.63	767.8	767.8	768.3	0.5
M	9.82	32	236	9.83	776.1	776.1	776.1	0.0
N	9.83	61	388	5.98	778.0	778.0	778.1	0.1
O	10.25	47	267	8.69	821.9	821.9	822.5	0.6
P	10.72	131	948	2.45	852.0	852.0	852.0	0.0
Q	10.74	180	1562	1.49	852.6	852.6	852.6	0.0
R	10.87	123	872	2.66	852.8	852.8	852.8	0.0
NORTH BRANCH DICKS CREEK								
A	2.28[2]	26	161	8.07	684.3	684.3	684.6	0.3
B	2.30[2]	51	248	5.24	685.2	685.2	685.5	0.3
C	2.32[2]	28	158	8.23	685.3	685.3	685.8	0.5
D	2.33[2]	52	263	4.94	686.5	686.5	686.7	0.2
E	2.56[2]	39	126	10.32	691.7	691.7	691.9	0.2
F	2.75[2]	28	133	9.77	700.2	700.2	700.2	0.0
G	2.76[2]	42	170	7.65	700.4	700.4	701.1	0.7
H	3.11[2]	44	143	9.09	708.2	708.2	708.7	0.5
I	3.43[2]	60	247	5.26	728.9	728.9	729.5	0.6
J	3.54[2]	42	232	5.60	738.5	738.5	739.0	0.5
K	3.55[2]	29	137	9.49	739.2	739.2	739.7	0.5

[1]MILES ABOVE CONFLUENCE WITH GREAT MIAMI RIVER
[2]MILES ABOVE MOUTH

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

FLOODWAY DATA

DICKS CREEK - NORTH BRANCH DICKS CREEK

BEST COPY AVAILABLE

BEST COPY AVAILABLE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
MUDDY CREEK								
A	6.76	47	135	9.63	814.8	814.8	815.2	0.4
B	6.97	55	239	5.44	826.0	826.0	826.5	0.5
C	7.21	112	341	3.81	832.0	832.0	832.1	0.1
D	7.48	72	242	5.37	838.3	838.3	838.4	0.1
E	7.67	82	307	4.23	842.4	842.4	842.8	0.4
MUDDY CREEK BRANCH No. 1								
A	0.71[2]	73[4]	63	6.51	788.7	788.7	788.7	0.0
B	0.72[2]	126[4]	718	0.57	789.8	789.8	789.8	0.0
C	1.14[2]	25[4]	78	5.26	816.7	816.7	817.1	0.4
MUDDY CREEK BRANCH No. 2								
A	0.90[3]	65	108	6.25	827.3	827.3	827.5	0.2
B	1.31[3]	61	186	3.63	843.1	843.1	843.6	0.5
C	1.64[3]	26	71	9.51	858.5	858.5	858.5	0.0

[1]MILES ABOVE CONFLUENCE WITH LITTLE MIAMI RIVER
[2]MILES ABOVE MOUTH
[3]MILES ABOVE CONFLUENCE WITH MUDDY CREEK
[4]THIS WIDTH EXTENDS WITHIN CITY OF MASON

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

FLOODWAY DATA

MUDDY CREEK -
MUDDY CREEK BRANCH NO. 1 - MUDDY CREEK BRANCH NO. 2

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
LITTLE MUDDY CREEK								
A	0.23	57	722	5.26	655.5	654.3[2]	654.8	0.5
B	0.59	257	2247	1.69	656.1	656.1	656.5	0.4
C	0.73	292	2240	1.70	656.2	656.2	656.7	0.5
D	1.03	749	5606	0.68	658.1	658.1	658.5	0.4
E	1.52	1015	7019	0.54	658.1	658.1	658.5	0.4
F	2.21	41	279	13.62	658.2	658.2	658.5	0.3
G	2.57	298	1812	2.10	662.6	662.6	662.9	0.3
H	2.94	184	1282	1.60	663.1	663.1	663.5	0.4
I	3.24	91	619	3.31	663.6	663.6	664.0	0.4
J	3.75	123	781	2.23	664.7	664.7	665.2	0.5
K	4.08	49	357	4.87	666.3	666.3	666.8	0.5
L	4.37	57	396	4.39	668.1	668.1	668.3	0.2
M	4.57	43	275	6.33	670.0	670.0	670.1	0.1
LITTLE MUDDY CREEK BRANCH No. 1								
A	1.36	21	100	6.95	691.5	691.5	692.0	0.5
B	1.54	23	91	7.64	697.1	697.1	697.2	0.1
C	1.91	34	102	6.81	710.6	710.6	711.1	0.5
D	2.30	50	153	4.54	720.1	720.1	720.1	0.0
E	2.49	29	75	9.27	728.6	728.6	728.6	0.0

[1]MILES ABOVE MOUTH
[2]ELEVATIONS WITHOUT CONSIDERING BACKWATER EFFECT FROM TURTLE CREEK

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

FLOODWAY DATA

LITTLE MUDDY CREEK - LITTLE MUDDY CREEK BRANCH NO. 1

BEST COPY AVAILABLE

BEST COPY AVAILABLE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
MULFORDS RUN								
A	0.35	73	210	5.36	684.5	684.5	685.0	0.5
B	0.44	28	145	7.76	688.1	688.1	688.1	0.0
C	0.45	23	97	11.60	689.0	689.0	689.2	0.2
D	0.62	37	113	9.96	702.9	702.9	702.9	0.0
E	0.86	57	160	7.03	728.7	728.7	728.7	0.0
REEDERS RUN								
A	0.32	68	372	6.85	685.5	685.5	686.4	0.9
B	0.52	65	234	10.90	691.1	691.1	691.1	0.0
C	0.85	90	488	5.45	710.0	710.0	710.0	0.0
D	0.87	75	402	6.34	710.2	710.2	710.2	0.0
E	1.05	61	267	9.55	726.2	726.2	726.7	0.5
F	1.26	53	218	11.70	741.8	741.8	741.8	0.0
G	1.55	47	211	12.09	763.0	763.0	763.0	0.0
H	1.89	97	268	6.46	783.9	783.9	784.1	0.2
I	1.92	180	1084	1.60	785.4	785.4	785.8	0.4
J	1.99	36	231	7.49	785.8	785.8	786.1	0.3
K	2.07	140	849	1.55	791.7	791.7	791.7	0.0
L	2.08	132	766	1.72	791.7	791.7	791.7	0.0
M	2.50	43	142	9.30	821.3	821.3	821.5	0.2
N	2.80	50	154	8.57	843.6	843.6	843.6	0.0

[1]MILES ABOVE MOUTH

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

FLOODWAY DATA

MULFORDS RUN - REEDERS RUN

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
TODD FORK								
A	1.50	917[2]	6761	4.54	664.8	664.8	665.5	0.7
B	1.80	194[2]	2678	10.67	668.9	668.9	669.4	0.5
C	1.83	301[2]	3206	9.58	670.2	670.2	670.5	0.3
D	2.26	464[2]	4854	6.32	677.0	677.0	677.5	0.5
E	3.00	268	2940	10.44	685.9	685.9	686.4	0.5
F	3.91	423	3913	7.46	700.3	700.3	700.8	0.5
G	4.05	168	2910	10.03	703.1	703.1	703.7	0.6
H	4.08	340	4527	6.45	704.5	704.5	704.9	0.4
I	4.32	387	1632	17.89	708.7	708.7	709.3	0.6
J	4.50	475	7873	3.71	713.3	713.3	714.0	0.7
K	4.94	381	5656	4.98	714.7	714.7	715.4	0.7
L	5.46	210	2097	13.44	718.9	718.9	719.4	0.5
M	5.48	335	4702	6.00	722.0	722.0	722.1	0.1
N	5.55	317	3530	7.99	723.3	723.3	723.3	0.0
O	5.58	312	4874	5.78	723.4	723.4	723.4	0.0
P	5.90	356	4565	6.18	725.1	725.1	725.3	0.2
Q	6.33	149	3263	8.64	727.4	727.4	727.9	0.5
R	6.36	370	5810	4.85	728.5	728.5	728.9	0.4
S	7.00	571	4708	5.99	732.0	732.0	732.4	0.4
T	7.53	161	3193	8.83	738.8	738.8	739.3	0.5
U	7.56	356	4261	6.62	739.7	739.7	740.0	0.3
V	8.02	462	3768	7.48	744.7	744.7	745.2	0.5
W	8.52	174	3189	8.84	751.9	751.9	752.6	0.7
X	8.54	451	6544	4.31	753.4	753.4	753.9	0.5
Y	8.76	589	7559	3.73	754.2	754.2	754.7	0.5
Z	8.91	267	3592	7.85	755.0	755.0	755.5	0.5

[1]MILES ABOVE CONFLUENCE WITH LITTLE MIAMI RIVER
[2]THIS WIDTH EXTENDS WITHIN VILLAGE OF MORROW

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

FLOODWAY DATA

TODD FORK

BEST COPY AVAILABLE

BEST COPY AVAILABLE

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
TODD FORK								
AA	8.95	416	4915	5.74	756.0	756.0	756.3	0.3
AB	9.28	239	3409	8.27	760.3	760.3	760.7	0.4
AC	9.53	223	4287	6.58	762.8	762.8	763.3	0.5
AD	9.57	443	6746	4.18	763.4	763.4	763.9	0.5
AE	10.17	329	3596	7.84	766.0	766.0	766.4	0.4
AF	10.74	372	4467	6.31	771.9	771.9	772.2	0.3
AG	11.48	473	5591	5.04	776.9	776.9	777.4	0.5
AH	11.80	413	4994	5.64	778.7	778.7	779.1	0.4
AI	12.17	311	5170	5.45	781.6	781.6	782.1	0.5
AJ	12.22	464	6681	4.22	782.0	782.0	782.5	0.5
AK	12.47	593	6146	4.59	783.2	783.2	783.7	0.5
AL	13.07	469	5114	5.51	787.3	787.3	787.8	0.5
AM	13.64	816	7641	3.69	790.8	790.8	791.3	0.5
AN	14.00	400	5125	5.50	792.2	792.2	792.7	0.5
AO	14.38	172	2331	10.27	793.9	793.9	794.4	0.5
PINE RUN								
A	1.03[2]	27	58	8.45	826.3	826.3	826.3	0.0
B	1.40[2]	46	167	2.93	836.1	836.1	836.7	0.6
C	1.53[2]	52	354	1.38	846.8	846.8	846.9	0.1
D	1.54[2]	115	532	0.92	846.9	846.9	846.9	0.0
E	1.88[2]	45	68	7.21	850.5	850.6	851.0	0.4

[1]MILES ABOVE CONFLUENCE WITH LITTLE MIAMI RIVER
[2]MILES ABOVE CONFLUENCE WITH MUDDY CREEK

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

FLOODWAY DATA

TODD FORK - PINE RUN

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
LAKE CHETAC CREEK								
A	2.79	11	63	10.24	832.0	832.0	832.5	0.5
B	2.81	43	161	4.01	835.2	835.2	835.2	0.0
C	3.00	25	68	9.49	841.6	841.6	841.7	0.1
D	3.08	30	74	8.72	854.7	854.7	854.7	0.0
E	3.30	71	264	2.44	857.5	857.5	858.0	0.5
F	3.39	251	327	1.97	873.6	873.6	873.6	0.0
G	3.64	30	57	6.67	873.9	873.9	873.9	0.0
H	3.90	18	56	6.79	886.8	886.8	887.1	0.3
POLK RUN								
A	4.21	30	261	4.90	806.3	806.3	806.8	0.5
B	4.23	122	955	1.34	806.7	806.7	807.2	0.5
C	4.57	27	111	11.53	811.5	811.5	811.5	0.0
D	4.98	42	204	6.27	838.0	838.0	838.4	0.4
E	5.37	41	96	7.29	857.4	857.4	857.4	0.0
F	5.42	13	90	7.78	860.1	860.1	860.1	0.0
G	5.44	75	180	3.89	861.7	861.7	861.9	0.2
H	5.65	148	519	1.35	874.7	874.7	875.1	0.4
I	5.66	181	536	1.31	874.7	874.7	875.1	0.4
J	5.81	27	74	9.46	881.8	881.8	882.1	0.3
K	5.88	76	307	2.28	888.2	888.2	888.2	0.0
L	5.91	94	260	2.69	889.2	889.2	889.2	0.0
M	5.96	60	228	3.07	892.0	892.0	892.3	0.3
N	5.99	16	83	8.43	896.2	896.2	896.2	0.0

[1]MILES ABOVE CONFLUENCE WITH LITTLE MIAMI RIVER

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

FLOODWAY DATA

LAKE CHETAC CREEK - POLK RUN

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FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION[2] AREA (SQ. FEET)	MEAN[2] VELOCITY (FEET/SEC.)	REGULATORY (NGVD)	WITHOUT FLOODWAY (NGVD)	WITH FLOODWAY (NGVD)	INCREASE (FEET)
SIMPSON CREEK								
A	2.31	214	1296	1.23	810.0	810.0	810.3	0.3
B	2.43	62	343	4.66	810.6	810.6	810.8	0.2
C	2.56	131	542	2.95	810.7	810.7	811.0	0.3
D	2.58	146	494	3.24	810.8	810.8	811.2	0.4
E	2.68	99	493	3.25	812.5	812.5	812.8	0.3
F	2.70	84	407	3.93	813.5	813.5	813.7	0.2
G	3.11	165	536	2.99	820.2	820.2	820.5	0.3
H	3.38	96	391	4.09	825.8	825.8	826.1	0.3
BEAR RUN								
A	0.39	64	673	5.57	620.8	620.8	620.8	0.0
B	0.40	56	470	7.98	620.8	620.8	620.8	0.0
C	0.48	216	1469	2.55	633.1	633.1	633.1	0.0
D	0.49	139	982	3.82	633.1	633.1	633.1	0.0
E	0.57	56	428	6.43	634.0	634.0	634.1	0.1
F	0.79	74	245	11.22	661.2	661.2	661.2	0.0
G	1.00	27	300	9.17	675.7	675.7	676.4	0.7
H	1.01	37	318	8.65	676.6	676.6	677.3	0.7
I	1.11	24	243	11.32	682.4	682.4	682.9	0.5
J	1.12	37	401	6.86	684.2	684.2	684.5	0.3
K	1.29	71	390	7.05	704.3	704.3	704.9	0.6
L	1.59	23	246	11.18	724.0	724.0	724.0	0.0
M	1.80	58	364	7.55	725.9	725.9	725.9	0.0
N	1.86	56	218	11.24	736.6	736.6	736.6	0.0

[1]MILES ABOVE CONFLUENCE WITH LITTLE MIAMI RIVER
[2]THESE ARE APPROXIMATE VALUES

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

FLOODWAY DATA

SIMPSON CREEK - BEAR RUN

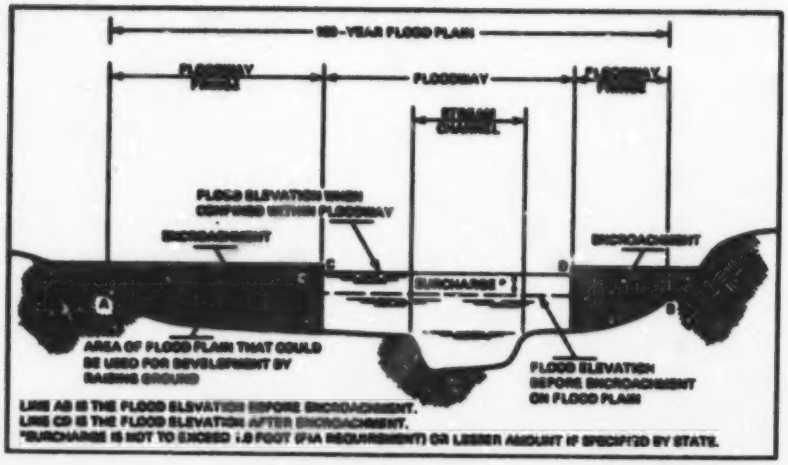
100-YEAR FLOOD PLAIN
FLOODWAY
FLOODWAY
FLOOD ELEVATION WHEN CONFINED WITHIN FLOODWAY
ENCROACHMENT
ENCROACHMENT
SURCHARGE *
AREA OF FLOOD PLAIN THAT COULD BE USED FOR DEVELOPMENT BY RAISING GROUND
FLOOD ELEVATION BEFORE ENCROACHMENT ON FLOOD PLAIN
LINE AB IS THE FLOOD ELEVATION BEFORE ENCROACHMENT.
LINE CD IS THE FLOOD ELEVATION AFTER ENCROACHMENT.
*SURCHARGE IS NOT TO EXCEED 1.0 FOOT (FIA REQUIREMENT) OR LESSER AMOUNT IF SPECIFIED BY STATE.

FIGURE 6 - Floodway Schematic

5.0 INSURANCE APPLICATION

In order to establish actuarial insurance rates, the FIA has developed a process to transform the data from the engineering study into flood insurance criteria. This process includes the determination of reaches, Flood Hazard Factors (FHF), and flood insurance zone designations for each flooding source affecting the unincorporated areas of Warren County.

5.1 Reach Determinations

Reaches are defined as lengths of watercourses having relatively the same flood hazard, based on the average weighted difference in water-surface elevations between the 10- and 100-year floods. This difference does not have a variation greater than that indicated in the following table for more than 20 percent of the reach.

Average Difference Between 10- and 100-year Floods	Variation
Less than 2 feet	0.5 foot
2 to 7 feet	1.0 foot
7.1 to 12 feet	2.0 feet
More than 12 feet	3.0 feet

The locations of the reaches determined for the unincorporated areas of Warren County are shown on the Flood Profiles (Exhibit 1) and are summarized in the Flood Insurance Zone Data Table (Table 4).

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5.2 Flood Hazard Factors

The FHF is used to correlate flood information with insurance rate tables. Correlations between property damage from floods and their FHFs are used to set actuarial insurance premium rate tables based on FHFs from 005 to 200.

The FHF for a reach is the average weighted difference between the 10- and 100-year flood water-surface elevations expressed to the nearest 0.5 foot, and shown as a three-digit code. For example, if the difference between water-surface elevations of the 10- and 100-year floods is 0.7 foot, the FHF is 005; if the difference is 1.4 feet, the FHF is 015; if the difference is 5.0 feet, the FHF is 050. When the difference between the 10- and 100-year water-surface elevations is greater than 10.0 feet, accuracy for the FHF is to the nearest foot.

5.3 Flood Insurance Zones

After the determination of reaches and their respective FHFs, the unincorporated areas of Warren County were divided into zones, each having a specific flood potential or hazard. Each zone was assigned one of the following flood insurance zone designations:

Zone A:	Special Flood Hazard Areas inundated by the 100-year flood, determined by approximate methods; no base flood elevations are shown or FHFs determined.
Zones A1-A15:	Special Flood Hazard Areas inundated by the 100-year flood, determined by detailed methods; base flood elevations are shown, and zones subdivided according to FHF.
Zone B:	Areas between the Special Flood Hazard Area and the limits of the 500-year flood, including areas of the 500-year flood plain that are protected from the 100-year flood by dike, levee, or other water control structure; or areas subject to certain types of 100-year shallow flooding where depths are less than 1.0 foot; and areas subject to 100-year flooding from sources with drainage areas less than 1 square mile. Zone B is not subdivided.
Zone C:	Areas of minimal flooding.

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Table 4, "Flood Insurance Zone Data," summarizes the flood elevation differences, FHFs, flood insurance zones, and base flood elevations for each flooding source studied in detail in the community.

5.4 Flood Insurance Rate Map Description

The Flood Insurance Rate Map for the unincorporated areas of Warren County is, for insurance purposes, the principal result of the Flood Insurance Study. This map (published separately) contains the official delineation of flood insurance zones and base flood elevation lines. Base flood elevation lines show the locations of the expected whole-foot water-surface elevations of the base (100-year) flood. This map is developed in accordance with the latest flood insurance map preparation guidelines published by the FIA.

6.0 OTHER STUDIES

In 1962, the Dicks Creek-Little Muddy Creek Subdistrict of the Miami Conservancy District, in conjunction with other public agencies, prepared the Watershed Work Plan: Dicks Creek-Little Muddy Creek Watersheds (Reference 6). This study examined the floodwater damage and discussed works of improvement to be installed. A modified plan was prepared in 1965 (Reference 29). No action has been taken on either plan in the Warren County area to date. In 1974, the Miami Conservancy District made a report on the Clear Creek watershed which recommended channel improvement and bridge modifications in the Franklin area (Reference 21).

In 1964, the Ohio Department of Natural Resources, Division of Water, published "Water Inventory of the Little Miami River and Mill Creek Basins" (Reference 2). Section 4 of this publication covers the flood problems of the Little Miami River generally but does not present any flood profiles or flood data for specific locations. A study of flood problems in the Great Miami River basin was made as part of the Miami River Water Inventory Report by the Ohio Department of Natural Resources in 1965. This report has not been published to date (Reference 5).

The Little Miami River Conservancy District was formed in 1933 to consider flooding problems in the valley. In 1966, the District published a Preliminary Engineering Report which recommended a program of improvements to be considered in developing the Official Plan of the Disctrict (Reference 30). The report contains no flood profiles or specific hydrologic and hydraulic data pertinent to this study.

In 1966, the Louisville District COE prepared a Flood Plain Information Study for the Little Miami River (Reference 31) in which the valley's flood problems and potential flood problems were presented. The Louisville District COE completed a restudy of the Little Miami River from the mouth to the Warren-Greene County, Ohio, line (mile 61.1) in 1977 (Reference 7). The study was made to reflect the effects of the Caesar Creek and East Fork Reservoirs upon the future floods in this

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FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1.0% (100-YEAR) FLOOD AND			FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION[3] (FEET NGVD)
		10% (10-YEAR)	2% (50-YEAR)	0.2% (500-YEAR)			
GREAT MIAMI RIVER							
REACH 1	0005	−3.3	−0.9	2.1	035	A7	VARIES—SEE MAP
REACH 2[4]	0005	−3.5	−1.1	1.8	035	A7	VARIES—SEE MAP
REACH 3	0005	−3.9	−1.3	2.0	040	A8	VARIES—SEE MAP
LITTLE MIAMI RIVER							
REACH 1	0065, 0070 0085, 0090	−6.8	N/A	N/A	070	A14	VARIES—SEE MAP
REACH 2	0070	−6.1	N/A	N/A	060	A12	VARIES—SEE MAP
REACH 3	0055, 0070 0075	−5.0	N/A	N/A	050	A10	VARIES—SEE MAP
REACH 4	0015, 0035 0055	−4.5	N/A	N/A	045	A9	VARIES—SEE MAP
REACH 5	0015,0020 0035	−4.0	N/A	N/A	040	A8	VARIES—SEE MAP
TWIN CREEK							
REACH 1	0005	−1.2	−0.3	0.7	010	A2	VARIES—SEE MAP
TWIN CREEK NO. 2							
REACH 1	0010	−2.3	−1.1	0.7	025	A5	VARIES—SEE MAP
REACH 2	0010	−1.2	−0.4	0.5	010	A2	VARIES—SEE MAP

[1]FLOOD INSURANCE RATE MAP PANEL
[2]WEIGHTED AVERAGE
[3]ROUNDED TO NEAREST FOOT
[4]DATA FOR THIS REACH TAKEN FROM CITY OF FRANKLIN, OHIO FIS

REVISED: 8/4/87

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

FLOOD INSURANCE ZONE DATA

GREAT MIAMI RIVER—LITTLE MIAMI RIVER—TWIN CREEK—TWIN CREEK NO. 2

FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1.0% (100-YEAR) FLOOD AND			FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION[3] (NGVD)
		10% (10-YEAR)	2% (50-YEAR)	0.2% (500-YEAR)			
CLEAR CREEK							
REACH 1	0005	–2.4	–0.7	1.1	025	A5	VARIES–SEE MAP
REACH 2	0005	–2.4	–0.7	1.1	025	A5	VARIES–SEE MAP
REACH 3	0005,0010	–1.7	–0.5	1.0	015	A3	VARIES–SEE MAP
REACH 4	0010	–1.0	–0.3	0.6	010	A2	VARIES–SEE MAP
REACH 5	0010	–2.7	–0.4	0.9	025	A5	VARIES–SEE MAP
REACH 6	0010	–1.1	–0.3	0.6	010	A2	VARIES–SEE MAP
TOMMYS RUN							
REACH 1	0005	–1.9	–0.5	0.6	020	A4	VARIES–SEE MAP
REACH 2	0005	–1.2	–0.4	0.6	010	A2	VARIES–SEE MAP
REACH 3	0005	–1.5	–0.6	0.6	015	A3	VARIES–SEE MAP
SHARTS BRANCH							
REACH 1	0005	–0.9	–0.3	0.8	010	A2	VARIES–SEE MAP
GANDER RUN							
REACH 1	0005	–0.8	–0.3	0.3	010	A2	VARIES–SEE MAP

[1]FLOOD INSURANCE RATE MAP PANEL
[2]WEIGHTED AVERAGE
[3]ROUNDED TO NEAREST FOOT

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

FLOOD INSURANCE ZONE DATA

CLEAR CREEK - TOMMYS RUN - SHARTS BRANCH - GANDER RUN

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FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1.0% (100-YEAR) FLOOD AND			FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION[3] (NGVD)
		10% (10-YEAR)	2% (50-YEAR)	0.2% (500-YEAR)			
TURTLE CREEK							
REACH 1	0070	–7.4	–5.0	2.1	075	A15	VARIES–SEE MAP
REACH 2	0070	–4.8	–2.9	2.0	050	A10	VARIES–SEE MAP
REACH 3	0050,0070	–3.1	–0.7	1.7	030	A6	VARIES–SEE MAP
REACH 4	0050	–2.3	–0.7	1.5	025	A5	VARIES–SEE MAP
REACH 5	0050	–6.5	–2.1	4.6	065	A13	VARIES–SEE MAP
REACH 6	0050	–4.4	–1.4	2.5	045	A9	VARIES–SEE MAP
REACH 7	0050	–2.5	–0.6	0.4	025	A5	VARIES–SEE MAP
NORTH FORK							
REACH 1	0030,0050	–0.9	–0.3	0.5	010	A2	VARIES–SEE MAP
REACH 2	0030	–2.2	–0.6	2.1	020	A4	VARIES–SEE MAP
REACH 3	0030	–0.9	–0.3	0.6	010	A2	VARIES–SEE MAP
DRY RUN							
REACH 1[4]	0070	–2.1	–0.6	1.9	020	A4	VARIES–SEE MAP
REACH 2	0050,0070	–1.5	–0.4	0.8	015	A3	VARIES–SEE MAP
DRY RUN BRANCH							
REACH 1	0070	–0.6	–0.4	0.4	005	A1	VARIES–SEE MAP

[1]FLOOD INSURANCE RATE MAP PANEL
[2]WEIGHTED AVERAGE
[3]ROUNDED TO NEAREST FOOT
[4]DATA FOR THIS REACH TAKEN FROM VILLAGE OF SOUTH LEBANON, OHIO FIS

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

FLOOD INSURANCE ZONE DATA

TURTLE CREEK - NORTH FORK - DRY RUN - DRY RUN BRANCH

FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1.0% (100-YEAR) FLOOD AND			FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION[3] (NGVD)
		10% (10-YEAR)	2% (50-YEAR)	0.2% (500-YEAR)			
RICHARDS RUN							
REACH 1	0010	–1.0	–0.3	0.3	010	A2	VARIES–SEE MAP
REACH 2	0010	–1.6	–0.4	0.7	015	A3	VARIES–SEE MAP
REACH 3	0010	–1.0	–0.3	0.5	010	A2	VARIES–SEE MAP
COON CREEK							
REACH 1	0010	–1.0	–0.3	0.4	010	A2	VARIES–SEE MAP
RAPID RUN							
REACH 1	0010	–0.8	–0.2	0.5	010	A2	VARIES–SEE MAP
DICKS CREEK							
REACH 1	0025	–1.2	–0.3	0.6	010	A2	VARIES–SEE MAP
NORTH BRANCH DICKS CREEK							
REACH 1	0025	–1.2	–0.3	0.8	010	A2	VARIES–SEE MAP

[1]FLOOD INSURANCE RATE MAP PANEL
[2]WEIGHTED AVERAGE
[3]ROUNDED TO NEAREST FOOT

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TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

FLOOD INSURANCE ZONE DATA

RICHARDS RUN - COON CREEK - RAPID RUN - DICKS CREEK - NORTH BRANCH DICKS CREEK

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FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1.0% (100-YEAR) FLOOD AND			FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION[3] (NGVD)
		10% (10-YEAR)	2% (50-YEAR)	0.2% (500-YEAR)			
MUDDY CREEK							
REACH 1[4]	0065	–1.2	–0.4	0.7	010	A2	VARIES–SEE MAP
MUDDY CREEK BRANCH No. 1							
REACH 1[4]	0065	–1.4	–0.6	0.1	015	A3	VARIES–SEE MAP
REACH 2[4]	0065	–2.9	–0.9	1.2	030	A6	VARIES–SEE MAP
REACH 3[4]	0065	–0.6	–0.2	0.3	005	A1	VARIES–SEE MAP
MUDDY CREEK BRANCH No. 2							
REACH 1	0065	–0.8	–0.2	0.4	010	A2	VARIES–SEE MAP
LITTLE MUDDY CREEK							
REACH 1	0045	–2.6	–0.8	1.5	025	A5	VARIES–SEE MAP

[1]FLOOD INSURANCE RATE MAP PANEL
[2]WEIGHTED AVERAGE
[3]ROUNDED TO NEAREST FOOT
[4]DATA FOR THIS REACH TAKEN FROM CITY OF MASON, OHIO FIS

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

FLOOD INSURANCE ZONE DATA

MUDDY CREEK - MUDDY CREEK BRANCH NO. 1 - MUDDY BRANCH NO. 2 - LITTLE MUDDY CREEK

FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1.0% (100-YEAR) FLOOD AND			FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION[3] (NGVD)
		10% (10-YEAR)	2% (50-YEAR)	0.2% (500-YEAR)			
LITTLE MUDDY CREEK BRANCH No. 1							
REACH 1	0045,0065	–0.8	–0.2	0.4	010	A2	VARIES–SEE MAP
MULFORDS RUN							
REACH 1	0050	–1.1	–0.3	0.5	010	A2	VARIES–SEE MAP
REEDERS RUN							
REACH 1	0030,0050	–1.4	–0.4	0.8	015	A3	VARIES–SEE MAP
TODD FORK							
REACH 1	0060,0075,0080	–2.8	–0.8	1.5	030	A6	VARIES–SEE MAP

[1]FLOOD INSURANCE RATE MAP PANEL
[2]WEIGHTED AVERAGE
[3]ROUNDED TO NEAREST FOOT

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

FLOOD INSURANCE ZONE DATA

LITTLE MUDDY CREEK BRANCH NO. 1 -
MULFORDS RUN - REEDERS RUN - TODD FORK

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FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1.0% (100-YEAR) FLOOD AND			FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION[3] (NGVD)
		10% (10-YEAR)	2% (50-YEAR)	0.2% (500-YEAR)			
PINE RUN							
REACH 1	0065	–0.6	–0.2	0.2	005	A1	VARIES–SEE MAP
REACH 2	0065	–1.7	–0.4	0.4	015	A3	VARIES–SEE MAP
REACH 3	0065	–0.3	–0.1	0.2	005	A1	VARIES–SEE MAP
LAKE CHETAC CREEK							
REACH 1	0085	–0.8	–0.2	0.4	010	A2	VARIES–SEE MAP
POLK RUN							
REACH 1	0085	–2.8	–1.1	2.4	030	A6	VARIES–SEE MAP
REACH 2	0085	–1.0	–0.3	0.5	010	A2	VARIES–SEE MAP
SIMPSON CREEK							
REACH 1	0085	–4.0	N/A	N/A	040	A8	VARIES–SEE MAP
REACH 2	0085	–0.9	N/A	N/A	010	A2	VARIES–SEE MAP
REACH 3	0085	–1.9	N/A	N/A	020	A4	VARIES–SEE MAP
BEAR RUN							
REACH 1	0070	–2.0	–0.6	1.1	020	A4	VARIES–SEE MAP
REACH 2	0070	–1.5	–0.4	0.9	015	A3	VARIES–SEE MAP

[1]FLOOD INSURANCE RATE MAP PANEL
[2]WEIGHTED AVERAGE
[3]ROUNDED TO NEAREST FOOT

TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

FLOOD INSURANCE ZONE DATA

PINE RUN - LAKE CHETAC CREEK - POLK RUN - SIMPSON CREEK - BEAR RUN

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FLOODING SOURCE	PANEL[1]	ELEVATION DIFFERENCE[2] BETWEEN 1.0% (100-YEAR) FLOOD AND			FLOOD HAZARD FACTOR	ZONE	BASE FLOOD ELEVATION[3] (FEET NGVD)
		10% (10-YEAR)	2% (50-YEAR)	0.2% (500-YEAR)			
CARLISLE DRAIN							
REACH 1	0005	−1.0	−0.5	0.4	010	A2	VARIES-SEE MAP
REACH 2	0005	−1.6	−0.6	0.9	015	A3	VARIES-SEE MAP

[1]FLOOD INSURANCE RATE MAP PANEL
[2]WEIGHTED AVERAGE
[3]ROUNDED TO NEAREST FOOT

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TABLE 4

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

FLOOD INSURANCE ZONE DATA

CARLISLE DRAIN

reach of the river. Results from this study are reflected in the flood boundaries of the Little Miami River in Warren County.

Flood Insurance Studies for Loveland, Mason, Morrow, South Lebanon, Corwin, Franklin, Lebanon, Waynesville, Hamilton County, and Green County agree with the results of this study (References 32, 19, 17, 16, 33, 23, 24, 18, 15, and 34).

A Flood Hazard Boundary Map has been published by the Federal Insurance Administration (Reference 28). The differences between the Flood Hazard Boundary Map and this study are justified due to the more detailed nature of this Flood Insurance Study.

This report either supersedes or is compatible with all previous studies published on streams studied in this report and should be considered authoritative for the purposes of the National Flood Insurance Program.

7.0 LOCATION OF DATA

Survey, hydrologic, hydraulic and other pertinent data used in this study can be obtained by contacting the Insurance and Mitigation Division, Federal Emergency Management Agency, One North Dearborn Street, Chicago, Illinois 60602.

8.0 REFERENCES AND BIBLIOGRAPHY

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2. Ohio Department of Natural Resources, Ohio Water Plan Inventory Report No. 18, Water Inventory of the Little Miami River and Mill Creek Basins and Adjacent Ohio River Tributaries, January 1964.

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4. U.S. Geological Survey, Water Resources Data for Ohio, 1970 thru 1975.

5. Ohio Department of Natural Resources, Preliminary Miami River Inventory Report, 1965 (not published to date).

6. Miami Conservancy District, Dicks Creek-Little Muddy Creek Watersheds, Work Plan for Watershed Protection and Flood Protection, March 1962.

7. U.S. Army Corps of Engineers, Louisville District, Flood Plain Information, Little Miami River, Hamilton, Clermont and Warren Counties, Ohio, March 1977.

8. Miami Conservancy District, "Great Miami River, at Franklin, Second Street Bridge, Annual Maximum Stages 1924-1975."

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12. ————, Bulletin No. 43, Supplement to Bulletin No. 32, 1969.

13. U.S. Geological Survey, 7.5 Minute Series Topographic Maps, Scale 1:24000, Contour Interval 20 feet: Franklin, Ohio, 1974; Contour Interval 10 feet: Springboro, Ohio, 1974; Waynesville, Ohio, 1974; New Burlington, Ohio, 1974; Monroe, Ohio, 1974; Lebanon, Ohio, 1974; Oregonia, Ohio, 1974; Mason, Ohio, 1974; South Lebanon, Ohio, 1968; Pleasant Plain, Ohio, 1968; Clarksville, Ohio, 1967; Contour Interval 5 feet: Blanchester, Ohio, 1974.

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18. ————, Flood Insurance Study, Village of Waynesville, Ohio, (in progress).

19. ————, Flood Insurance Study, City of Mason, Ohio, March 1979.

20. Miami Conservancy District, Great Miami River Cross Sections below Franklin, August 1970.

21. ————, Report on the Clear Creek Watershed, October 1974.

22. U.S. Department of Agriculture, Soil Conservation Service, Cross Sections on Clear Creek, Dicks Creek, Near Franklin, (revised) September 1968.

23. U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Insurance Study, City of Franklin, Ohio, (in progress).

24. ————, Flood Insurance Study, City of Lebanon, Ohio, March 1979.

25. U.S. Army Corps of Engineers, Hydraulic Engineering Center, HEC-2 Water-Surface Profiles, Generalized Computer Program, August 1969.

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26. Miami Conservancy District, Flood Profiles of Twin Creek Near Franklin, and Clear Creek, 1959.

27. ————, Flood Profiles of the Great Miami River, 1959.

28. U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Hazard Boundary Map, Unincorporated Areas of Warren County, Ohio, January 1978.

29. Miami Conservancy District, Modified Partial Plan Number One, Dicks Creek-Little Muddy Creek Subdistrict, June 1965.

30. ————, Preliminary Engineering Report, 1966.

31. U.S. Army Corps of Engineers, Louisville District, Flood Plain Information Study, Little Miami River, Ohio, December 1966.

32. U.S. Department of Housing and Urban Development, Federal Insurance Administration, Flood Insurance Study, City of Loveland, Ohio, September 1978.

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34. ————, Flood Insurance Study, Unincorporated Areas of Greene County, Ohio, (in progress).

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9.0 REVISIONS DESCRIPTION (Revised August 4, 1987)

9.1 Purpose

The purpose of this Flood Insurance Study Revisions Description is to incorporate new and revised data intc this currently effective Flood Insurance Study for the Unincorporated Areas of Warren County, Ohio. This Revisions Description is intended to provide updated information that aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

9.2 Acknowledgments

The hydrologic and hydraulic analyses for this Revisions Description were performed by the U.S. Army Corps of Engineers (COE), Louisville District. The Federal Emergency Management Agency (FEMA) reviewed and accepted these data for purposes of this revision.

9.3 Scope

The segment of Carlisle Drain from the mouth to just above Jill Lane was studied by the COE as part of their analyses for the Flood Insurance Study for the Village of Carlisle (Reference 1). The COE also revised their analysis of Twin Creek from the mouth to the Chessie System as a result of revised topographic information for this area (Reference 2).

The segment of the Little Miami River within Warren County was studied by the COE to match the flooding information presented in the Flood Insurance Studies for the Unincorporated Areas of Hamilton and Greene Counties (References 3 and 4).

9.4 Hydrologic and Hydraulic Analyses

The COE determined peak discharges for Carlisle Drain using computations outlined in a COE project report (Reference 5). Peak discharges are summarized in Table 5, Revised Summary of Discharges. The flood profiles for Carlisle Drain were obtained from a report on the Great Miami River prepared by the COE (Reference 5). In this report, the HEC-2 computer program (Reference 6) was used to compute water-surface elevations.

The COE modified the initial HEC-2 computer program to incorporate revised topographic information (Reference 2). Cross-section data were modified in the HEC-2 analysis, but peak discharges and roughness coefficients were unchanged for this reanalysis.

Final frequency-discharge relationships for the Little Miami River were taken from a previous floodplain study by the COE (Reference 7). The Little Miami River study utilized regional frequency studies of rainfall, drainage areas, ground cover, and slope to formulate discharges.

Peak discharges for the 100-year flood for the Little Miami River are summarized in Table 5, Revised Summary of Discharges.

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TABLE 5 - REVISED SUMMARY OF DISCHARGES

FLOODING SOURCE AND LOCATION	DRAINAGE AREA SQ MILES	PEAK DISCHARGES (CFS) 10-YEAR	50-YEAR	100-YEAR	500-YEAR
CARLISLE DRAIN					
at mouth	N/A	1,370	3,500	4,680	6,930
LITTLE MIAMI RIVER					
at downstream county boundary	N/A	N/A	N/A	79,000	N/A
just downstream of Maineville Road	N/A	N/A	N/A	77,800	N/A
just downstream of Gradin Road	N/A	N/A	N/A	77,400	N/A
just downstream of Conrail	N/A	N/A	N/A	76,100	N/A
just upstream of State Route 48	N/A	N/A	N/A	72,900	N/A
just downstream of Stubbs Mill Road	N/A	N/A	N/A	72,600	N/A
just downstream of Mill Grove Road	N/A	N/A	N/A	47,700	N/A
just downstream of State Route 350	N/A	N/A	N/A	47,000	N/A
just upstream of Wilmington Road	N/A	N/A	N/A	46,500	N/A
just upstream of Emmons Road	N/A	N/A	N/A	46,000	N/A
just upstream of County Highway 30	N/A	N/A	N/A	44,200	N/A
just downstream of State Route 73	N/A	N/A	N/A	43,700	N/A
at upstream county boundary	N/A	N/A	N/A	41,500	N/A

56

Cross-section data for the Little Miami River were obtained by integrating data from topographic maps (Reference 8) with field survey measurements. All bridges were surveyed to obtain elevation data and structural geometry to supplement the cross-section data.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). The selected cross-section locations are also shown on the Flood Boundary and Floodway Map (Exhibit 2) for the floodway of the Little Miami River.

Roughness coefficients (Manning's "n") for the Little Miami River were estimated by field inspection. Roughness coefficients ranged from 0.030 to 0.055 in the main channel and from 0.045 to 0.070 in the overbank areas.

Water-surface profiles were developed using the HEC-2 step-backwater computer model (Reference 6). Only the 100-year flood profile was determined for the Little Miami River. The 100-year starting water-surface elevation for the Little Miami River was taken from the Flood Insurance Study for Hamilton County (Reference 3). A 10-year flood profile was approximated using hydraulic information presented in the Flood Insurance Studies for Hamilton and Greene Counties and the Villages of Loveland, South Lebanon, Morrow, Waynesville, and Corwin (References 3, 4, and 9-13). The 10-year flood profile was approximated to assist in the computation of the Flood Hazard Factors for the Little Miami River.

9.5 Floodways

No floodway was computed for Carlisle Drain since it was studied by limited detail methods.

Floodway computations for the Little Miami River were revised as a result of the new COE hydraulic analysis. The floodways were computed on the basis of equal conveyance reduction from each side of the floodplain. The results of these computations were tabulated at selected cross sections for each stream segment for which a floodway was revised and are presented in Table 3, Floodway Data.

9.6 Other Studies

The revised flood information for Carlisle Drain and Twin Creek matches the flood information presented in the Flood Insurance Study for the Village of Carlisle (Reference 1). The new flood information for the Little Miami River agrees with the Flood Insurance Studies for Hamilton and Greene Counties, and the Villages of Loveland, South Lebanon, Morrow, Waynesville and Corwin (References 3, 4, and 9-13).

9.7 Location of Data

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting the Natural and Technological Hazards Division, FEMA, 300 South Wacker Drive, Chicago, Illinois 60606.

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9.8 References and Bibliography

1. Federal Emergency Management Agency, Flood Insurance Study, Village of Carlisle, Warren and Montgomery Counties, Ohio, April 1984.

2. U.S. Army Corps of Engineers, Louisville District, Topographic Maps Nos. 26-4/26-8, Scale 1:1200, Contour Interval 2 feet, Carlisle, Ohio, July 1980.

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11. ————, Flood Insurance Study, Village of Morrow, Warren County, Ohio, August 1978.

12. Federal Emergency Management Agency, Federal Insurance Administration, Flood Insurance Study, Village of Waynesville, Warren County, Ohio, August 1980.

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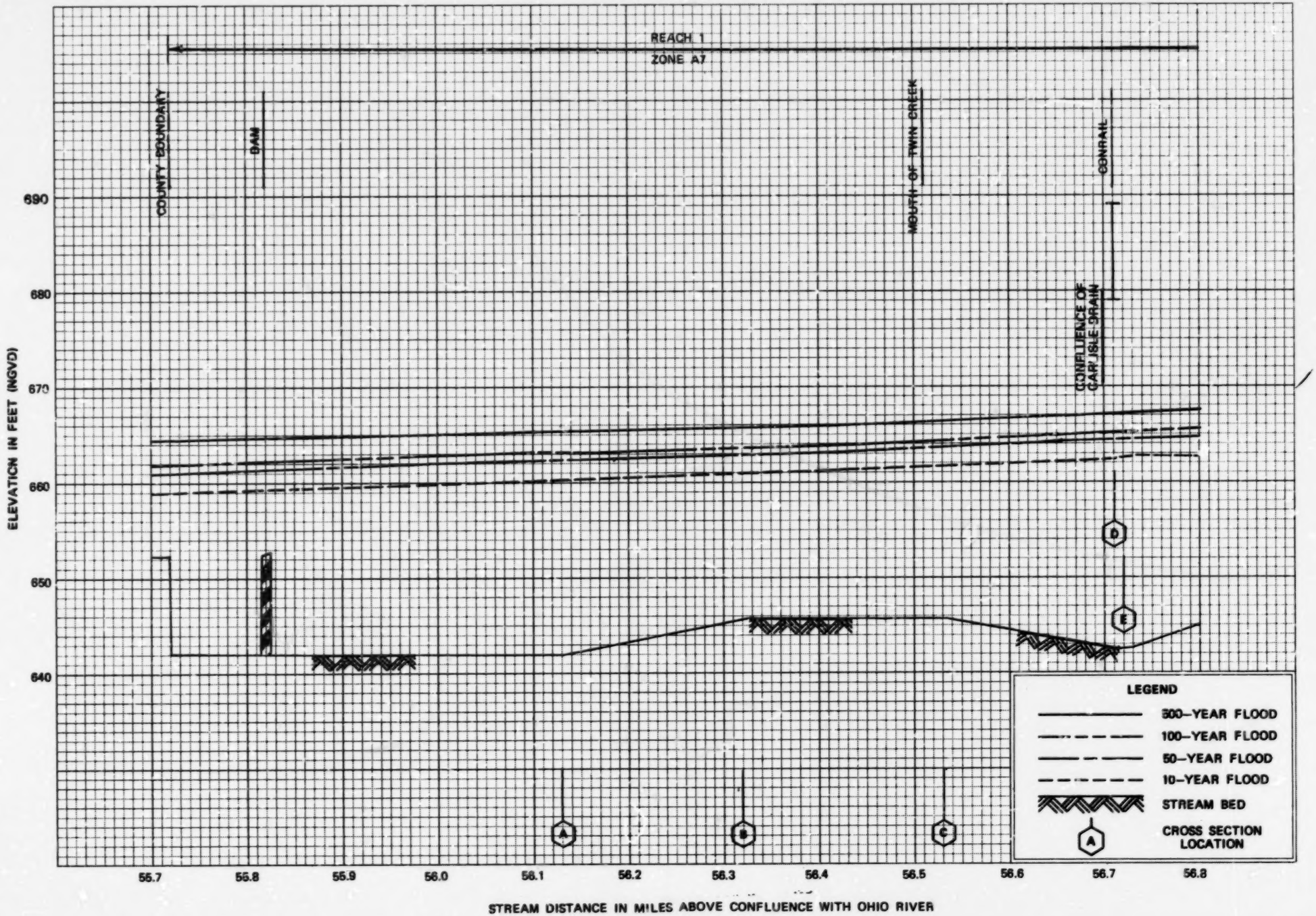

FLOOD PROFILES

GREAT MIAMI RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

01P

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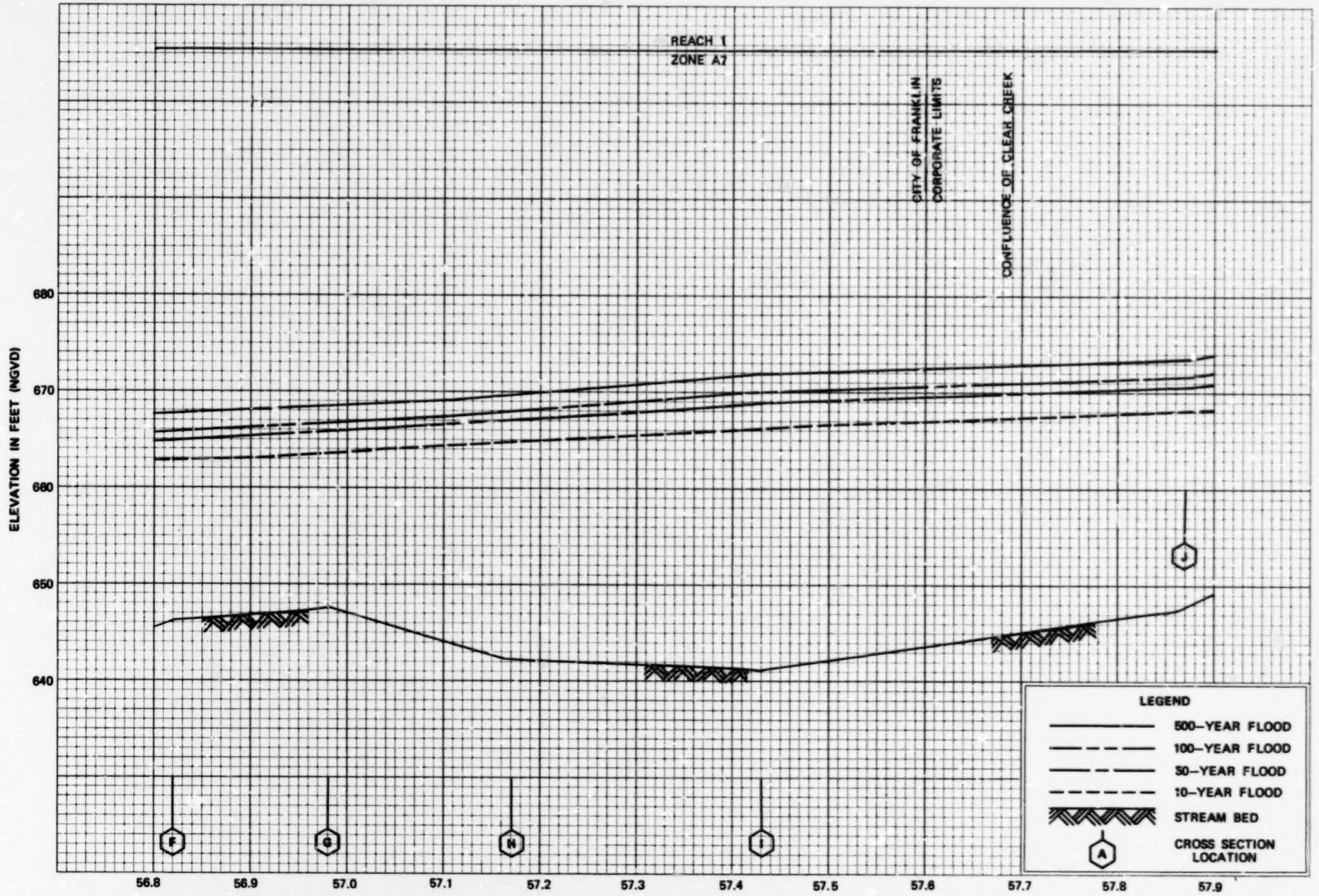

FLOOD PROFILES

GREAT MIAMI RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

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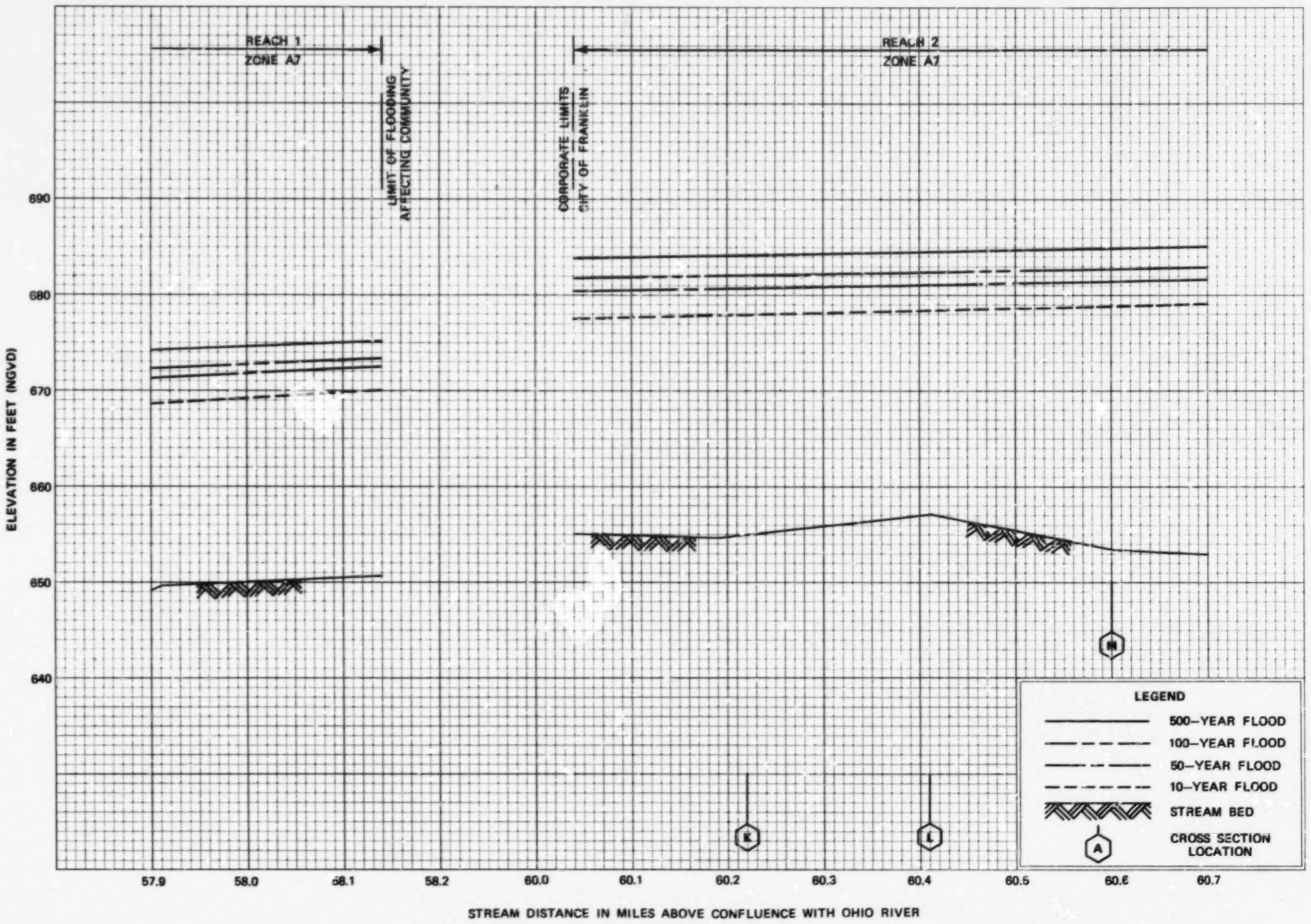

FLOOD PROFILES

GREAT MIAMI RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

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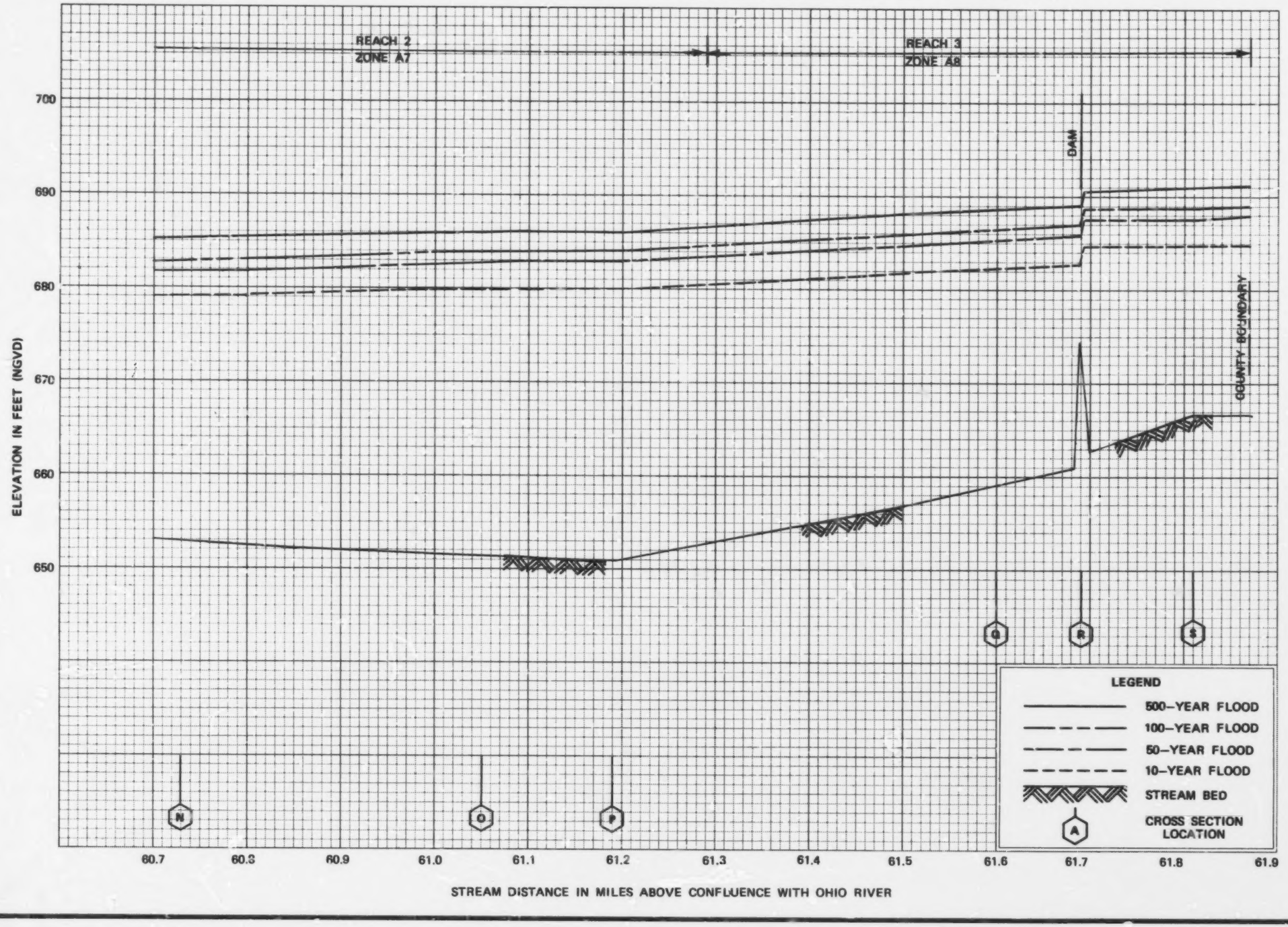

FLOOD PROFILES

GREAT MIAMI RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

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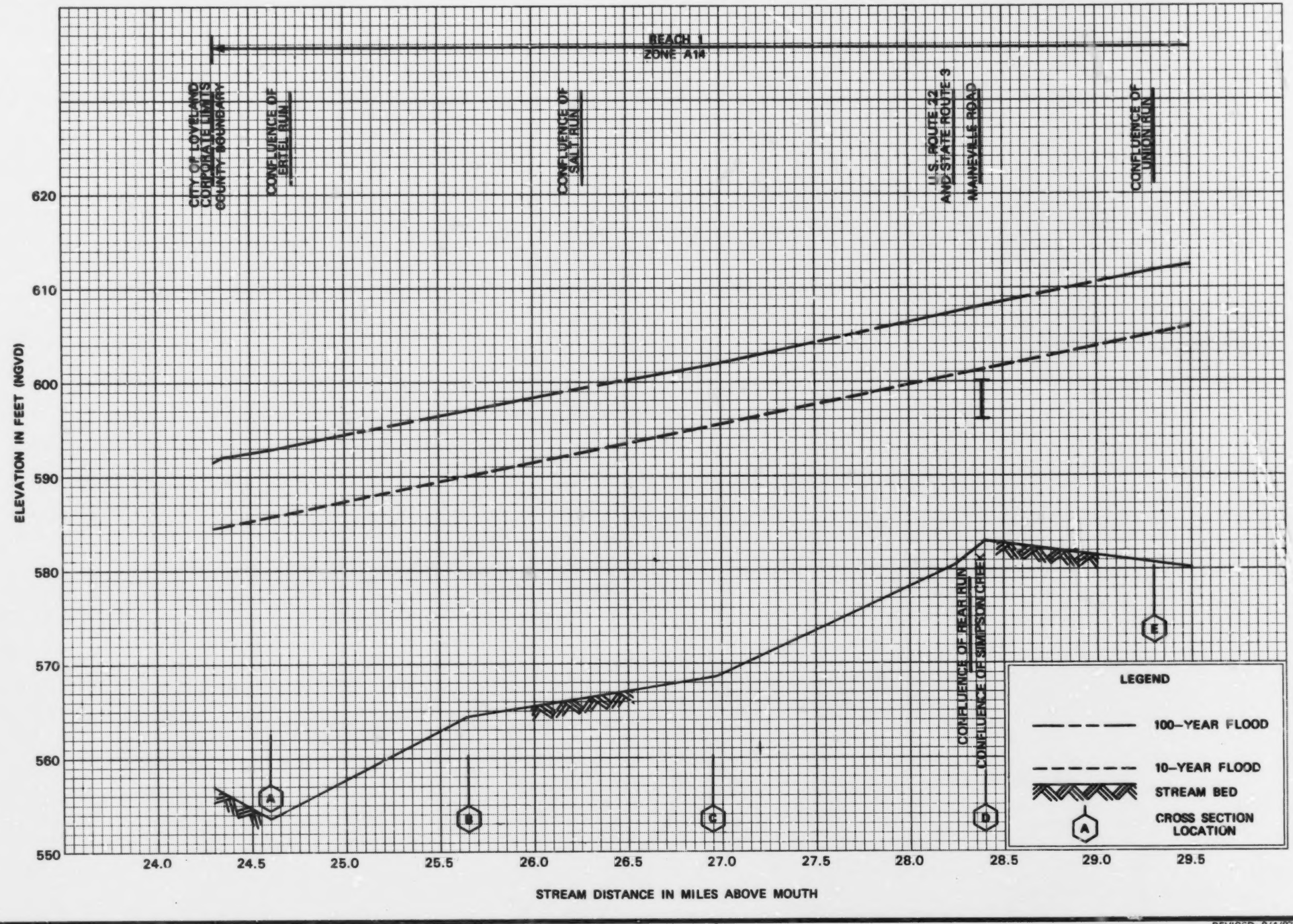

FLOOD PROFILES

LITTLE MIAMI RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

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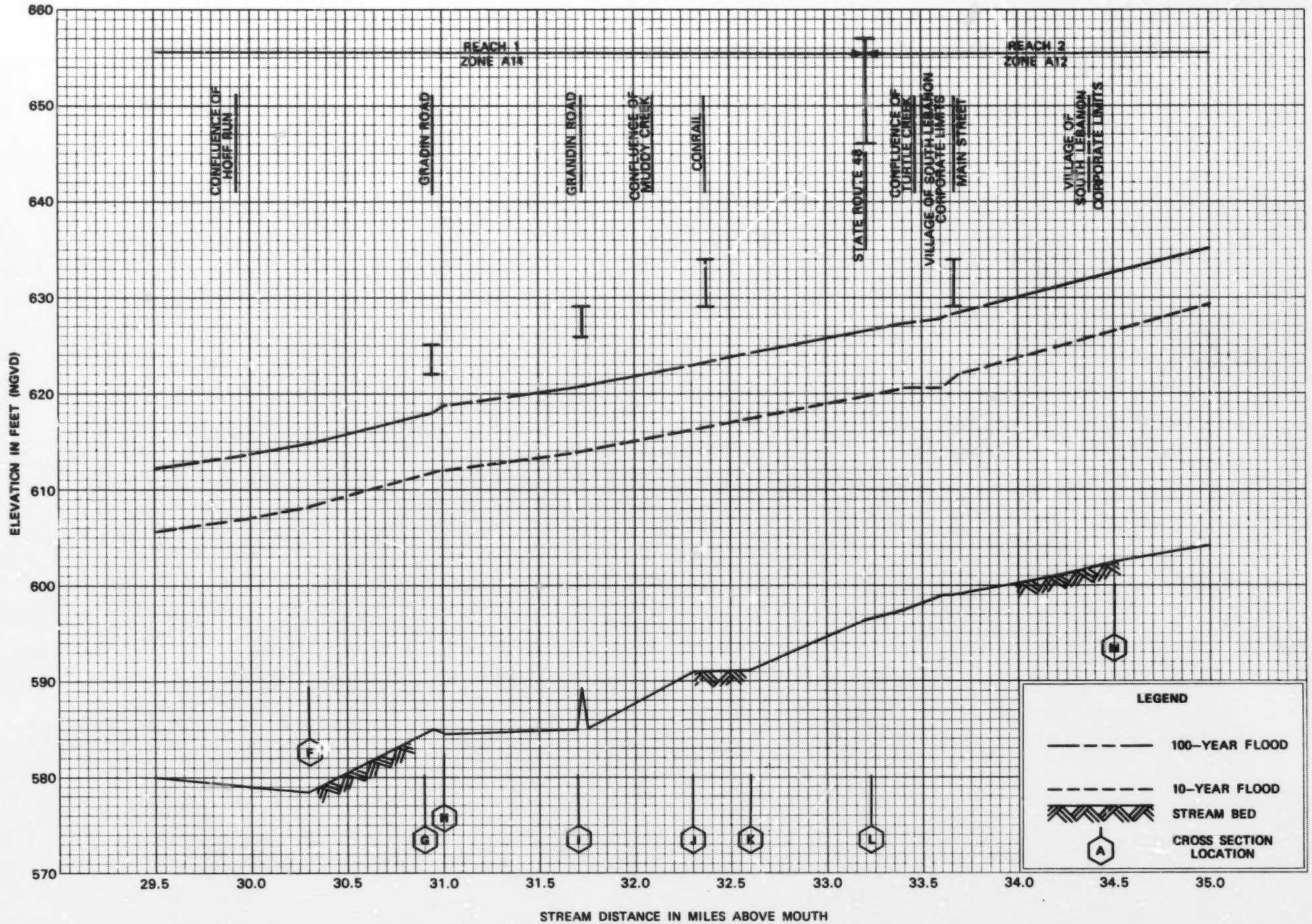

FLOOD PROFILES

LITTLE MIAMI RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

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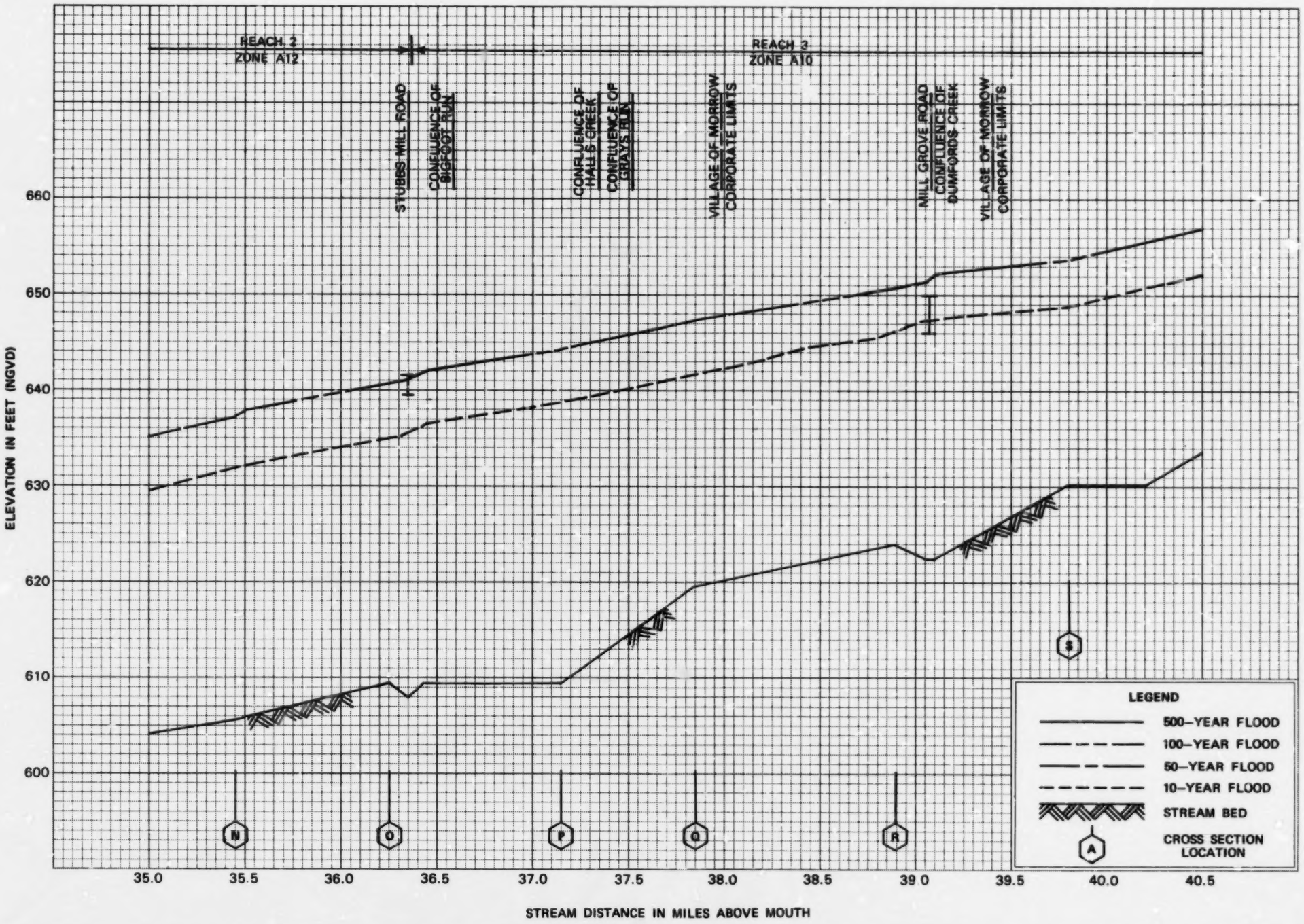

FLOOD PROFILES

LITTLE MIAMI RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

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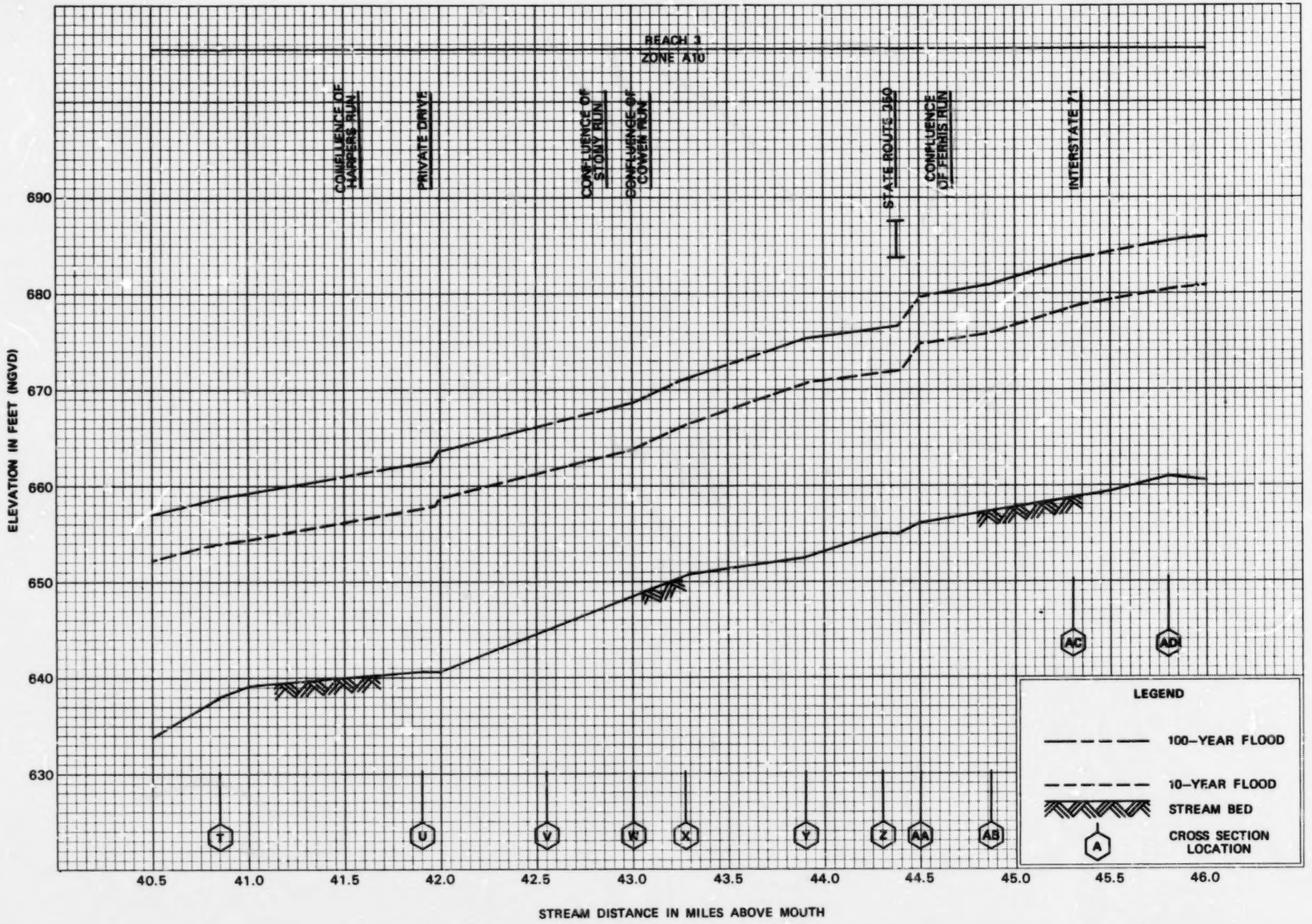

FLOOD PROFILES

LITTLE MIAMI RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

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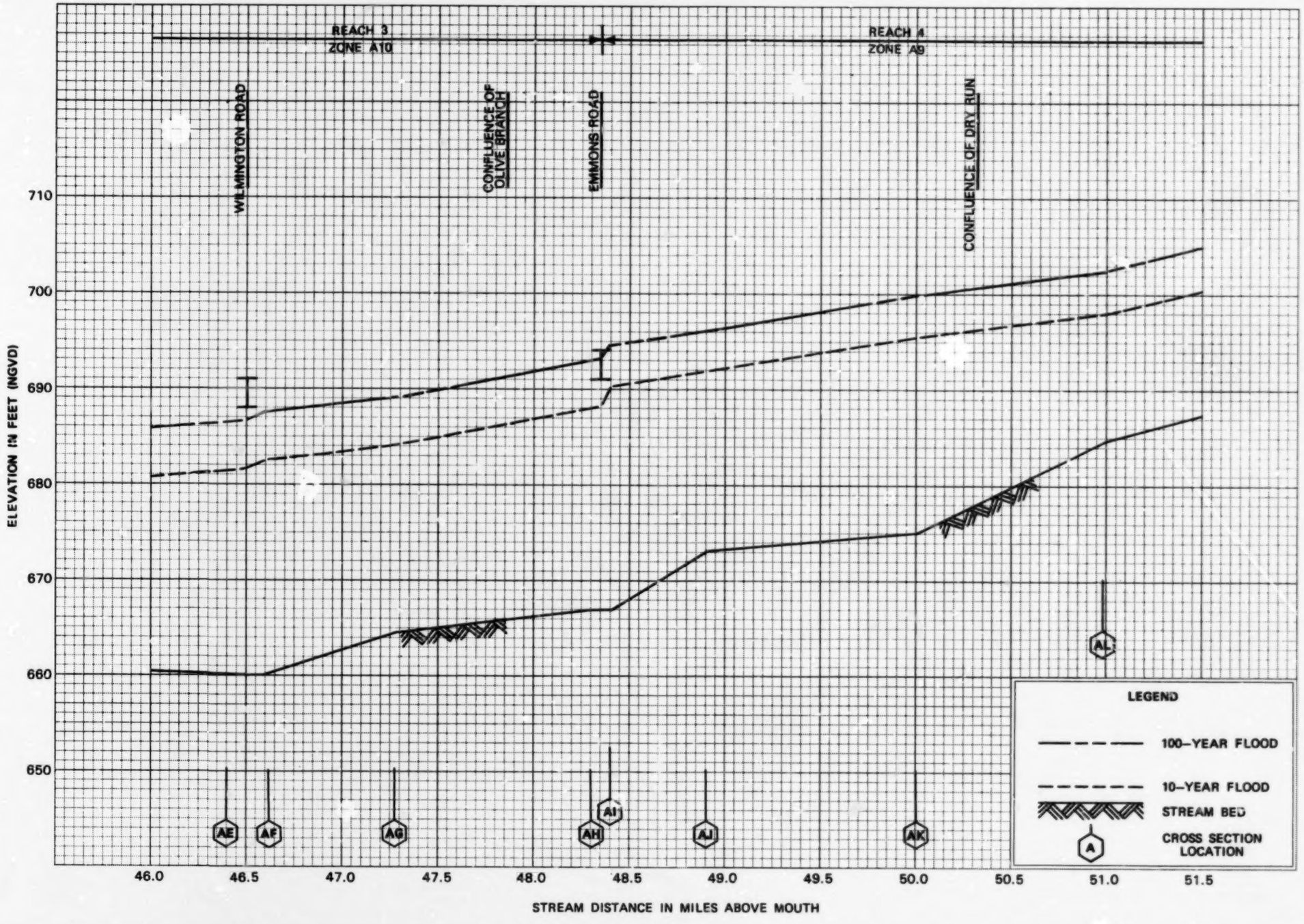

FLOOD PROFILES

LITTLE MIAMI RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

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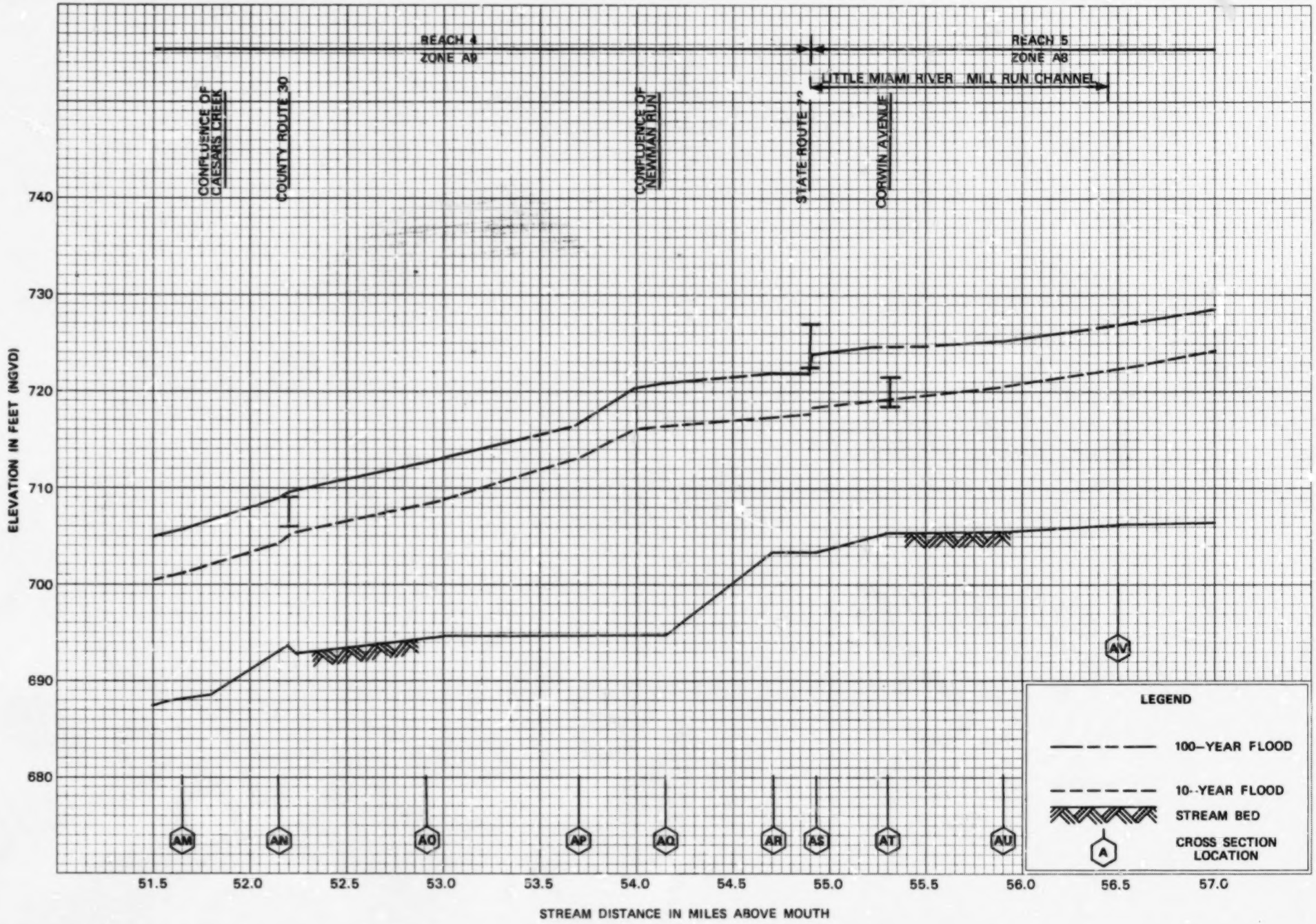

FLOOD PROFILES

LITTLE MIAMI RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

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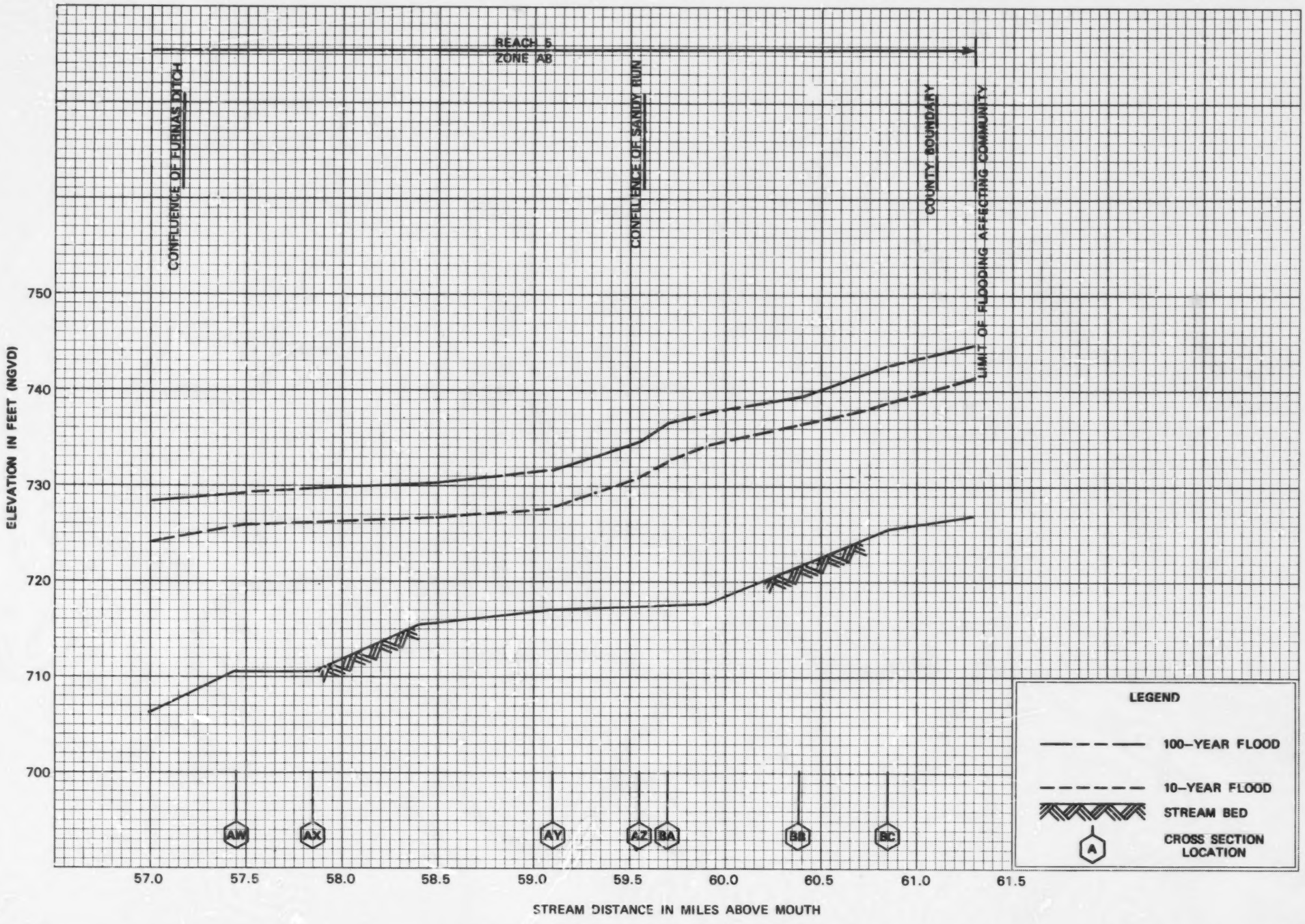

FLOOD PROFILES

LITTLE MIAMI RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

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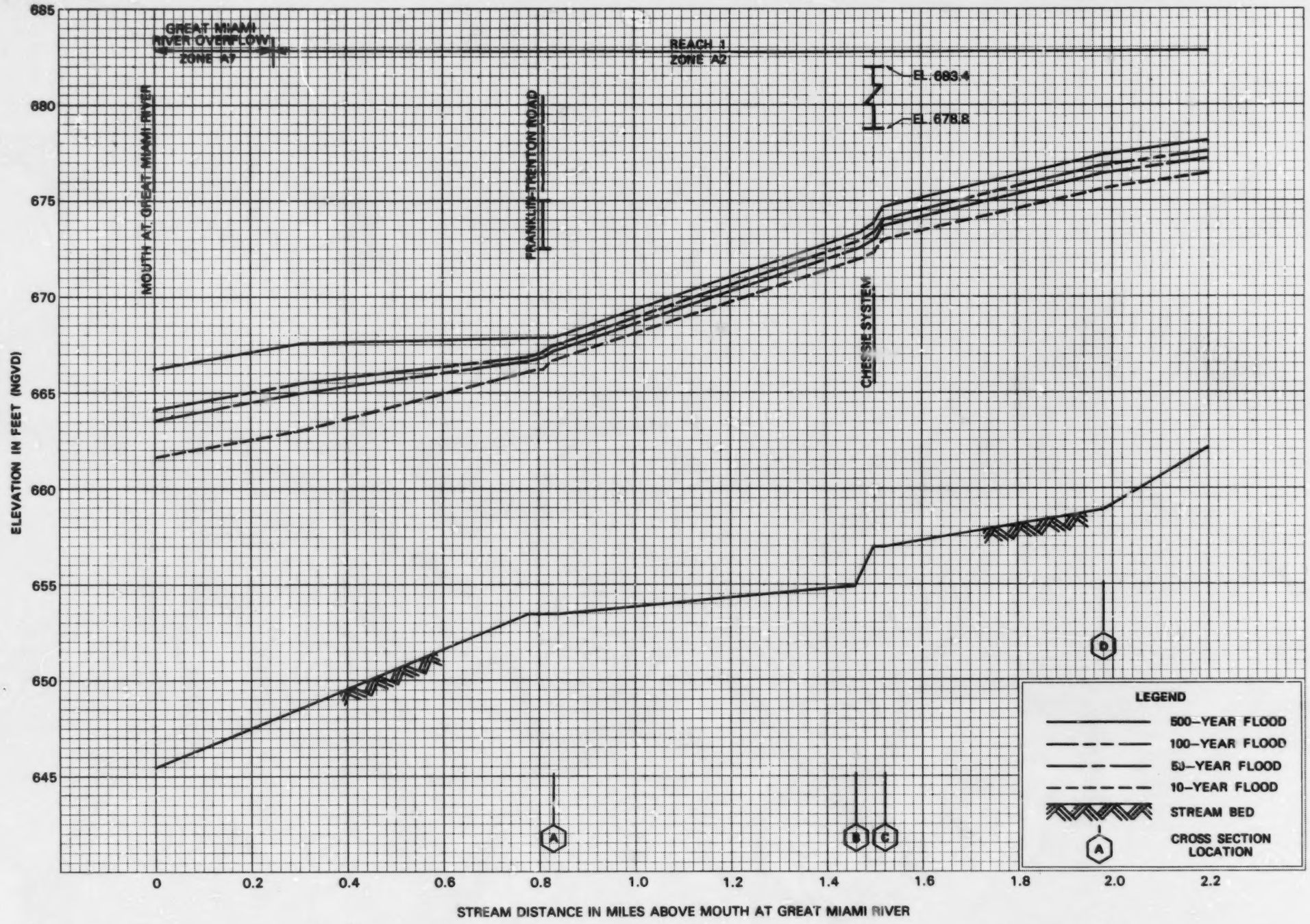

FLOOD PROFILES

TWIN CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

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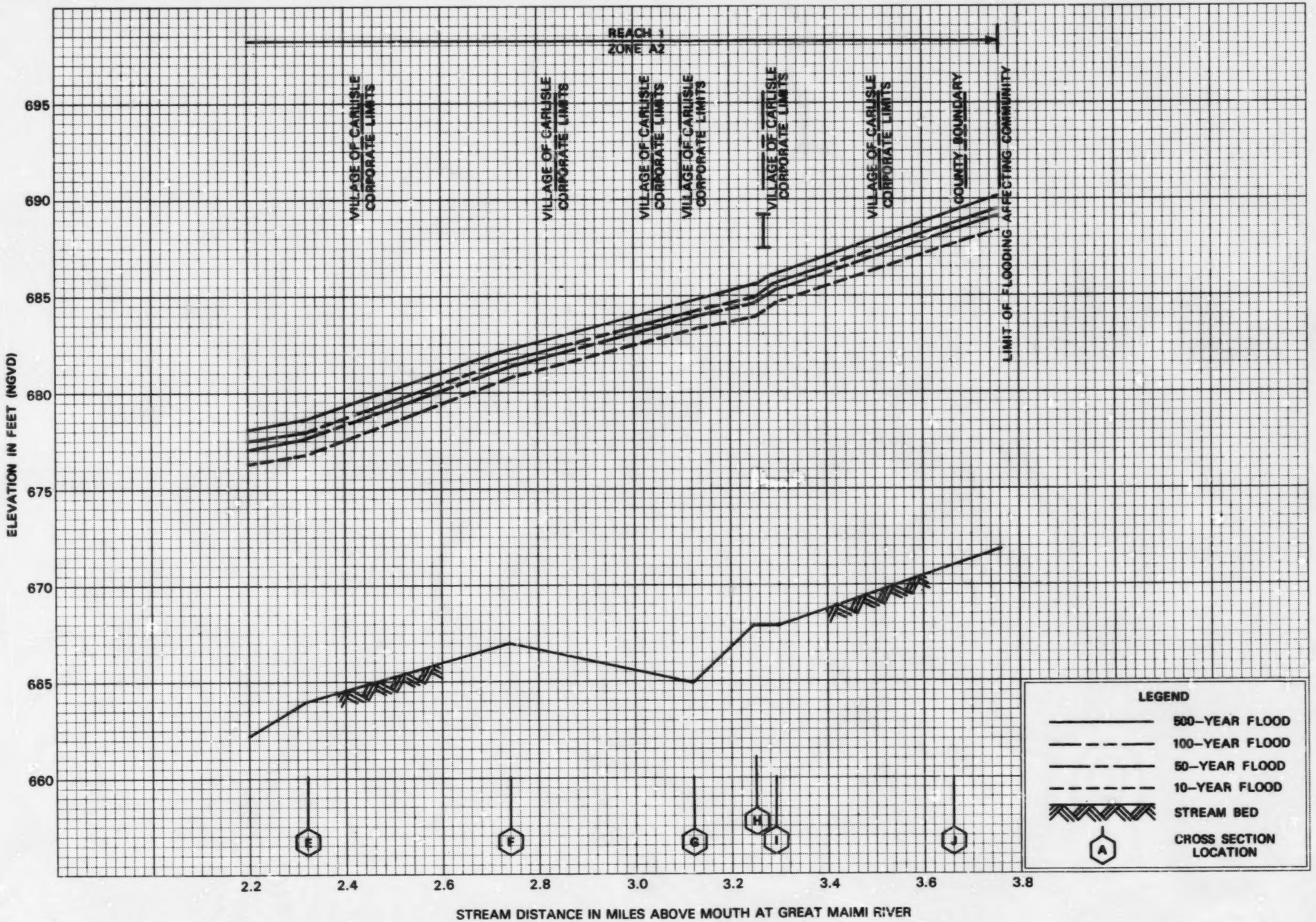

FLOOD PROFILES

TWIN CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

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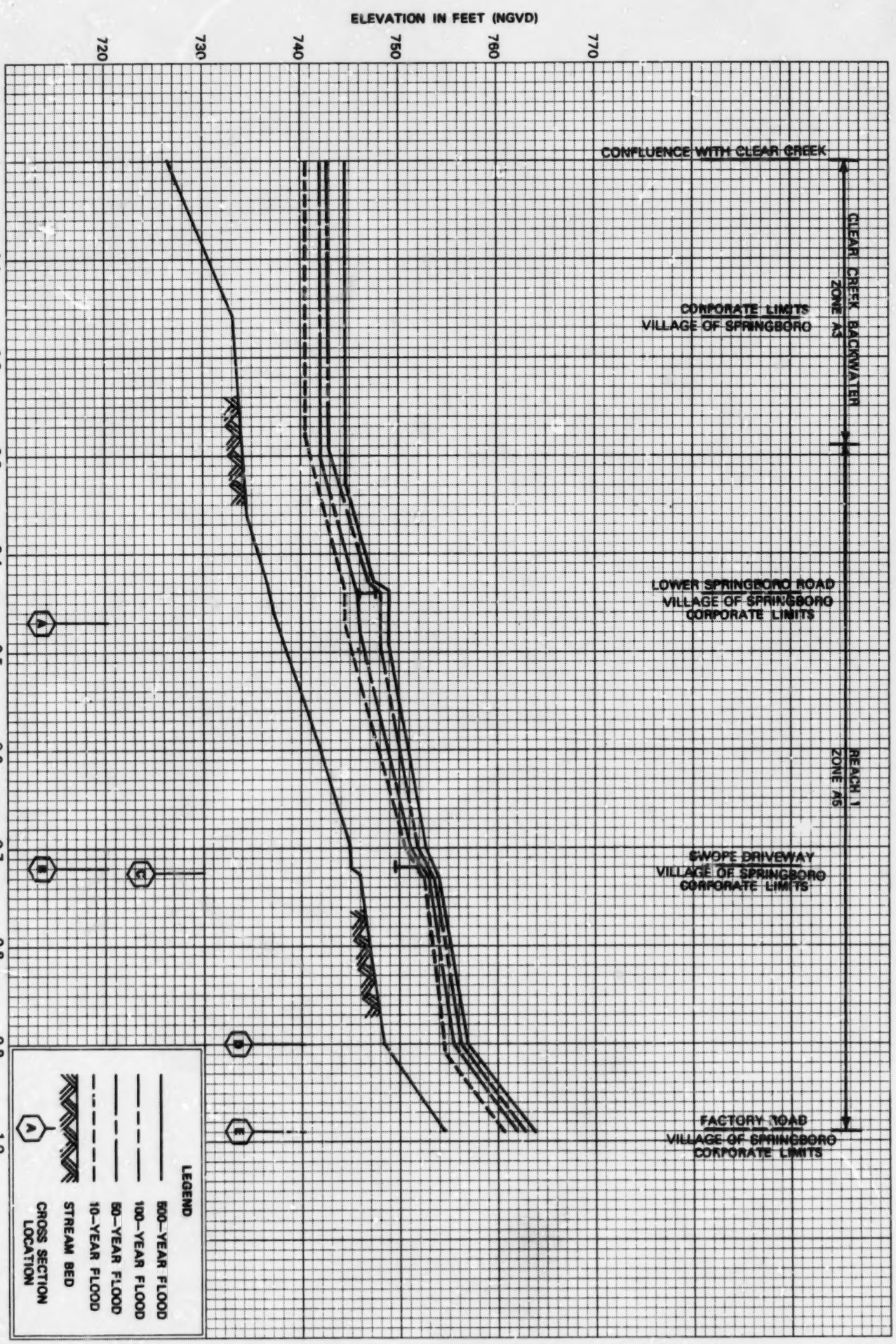

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FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

FLOOD PROFILES

TWIN CREEK NO. 2

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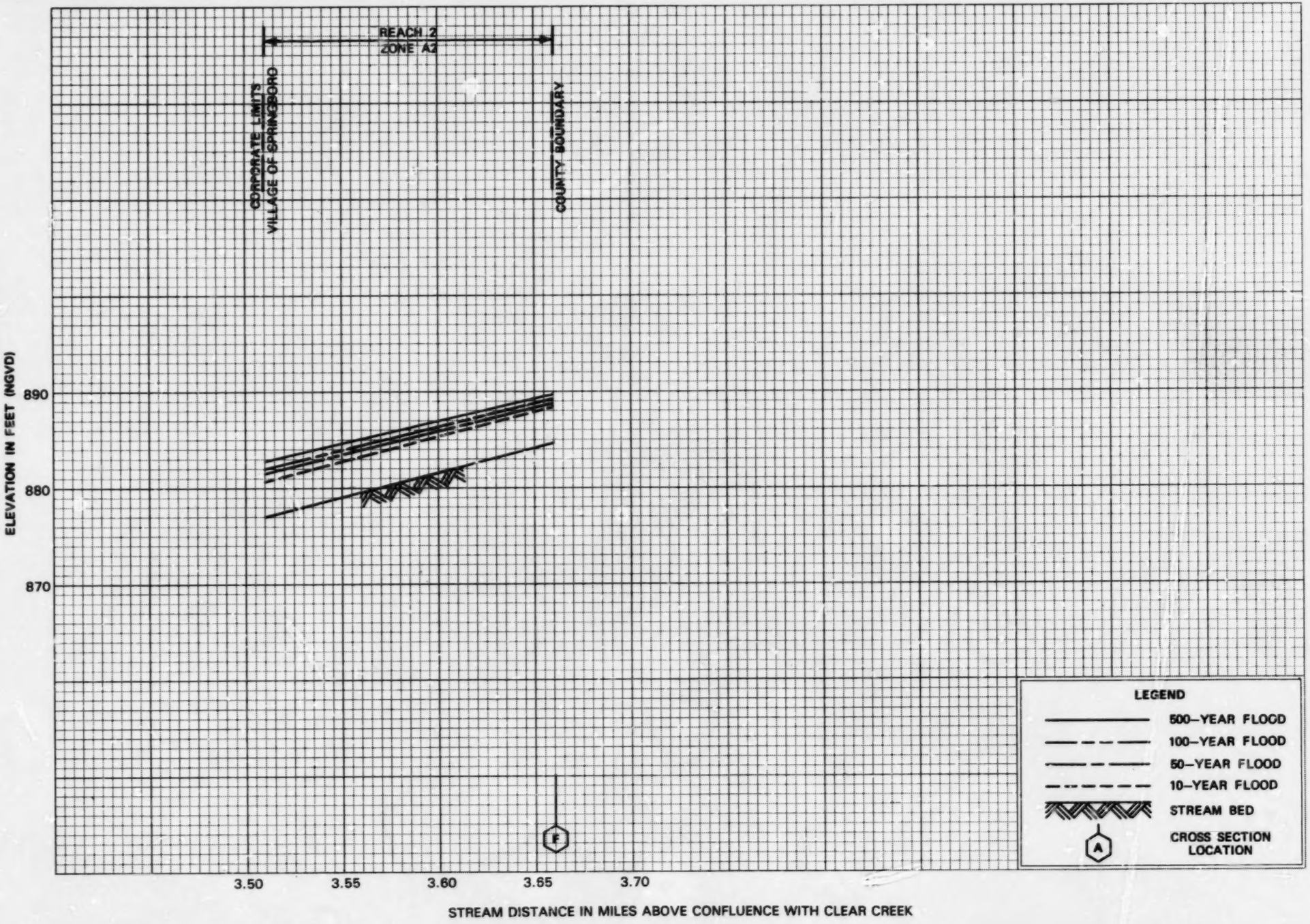

FLOOD PROFILES

TWIN CREEK NO. 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

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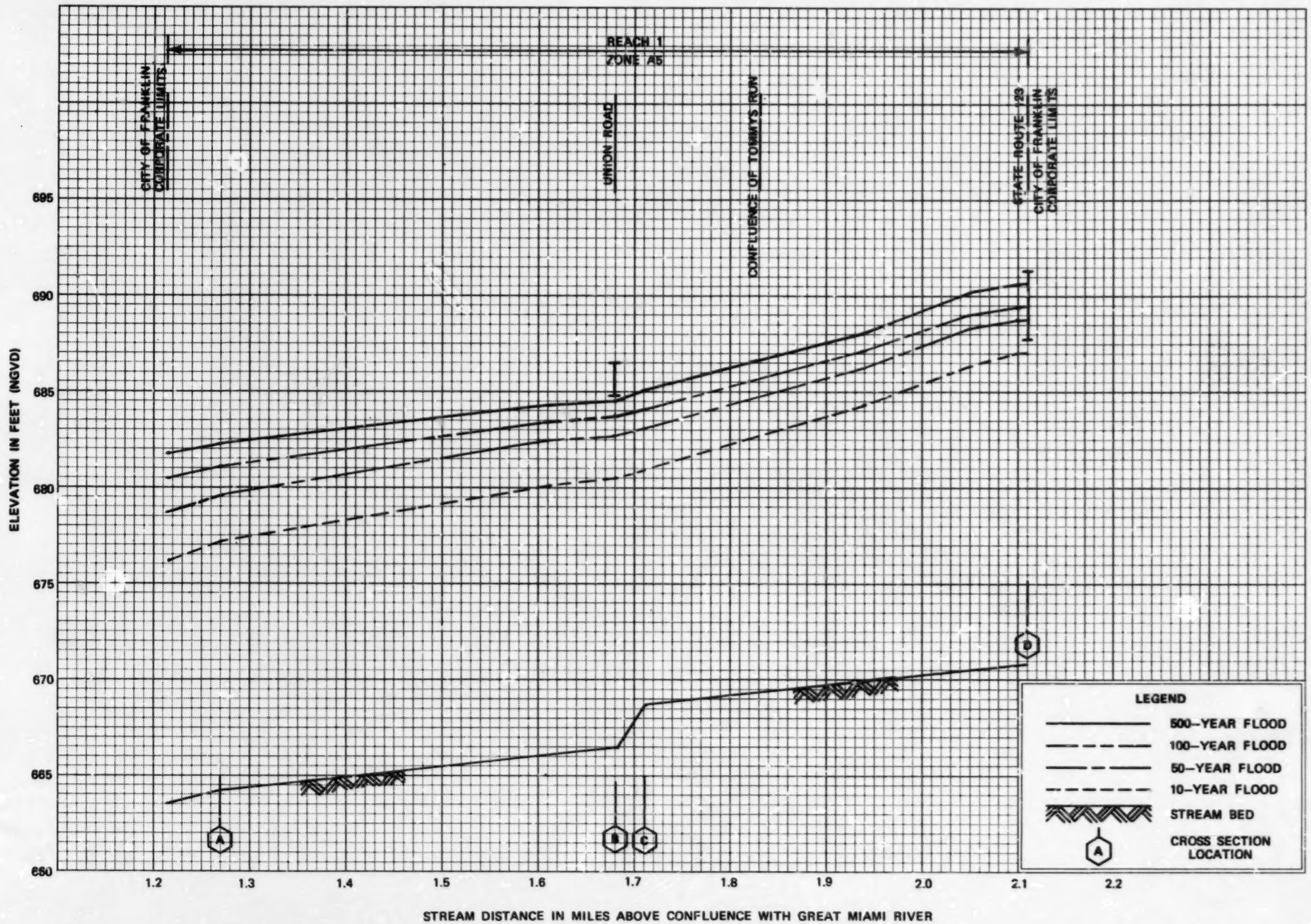

FLOOD PROFILES

CLEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

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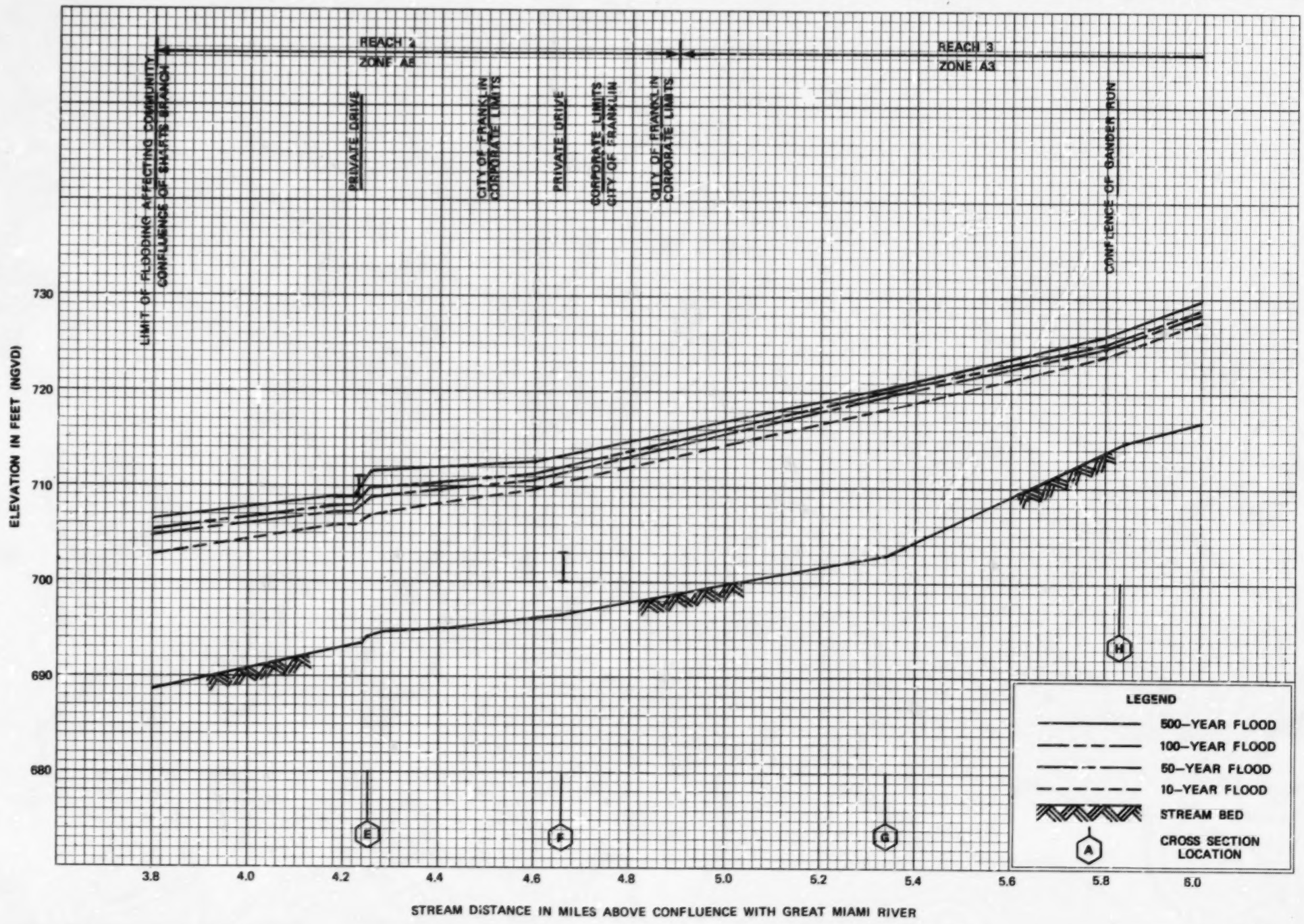

FLOOD PROFILES

CLEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

17P

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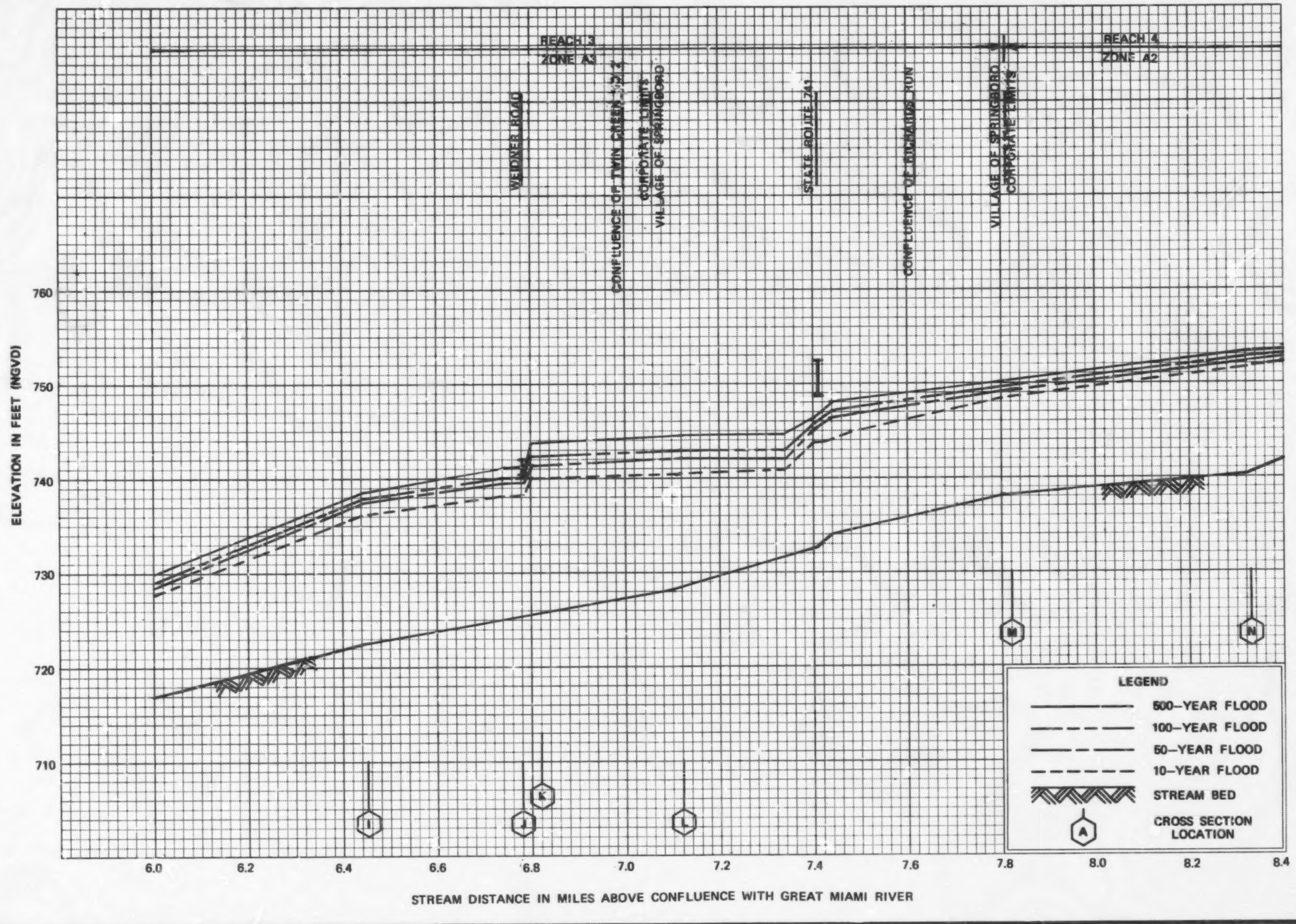

FLOOD PROFILES

CLEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

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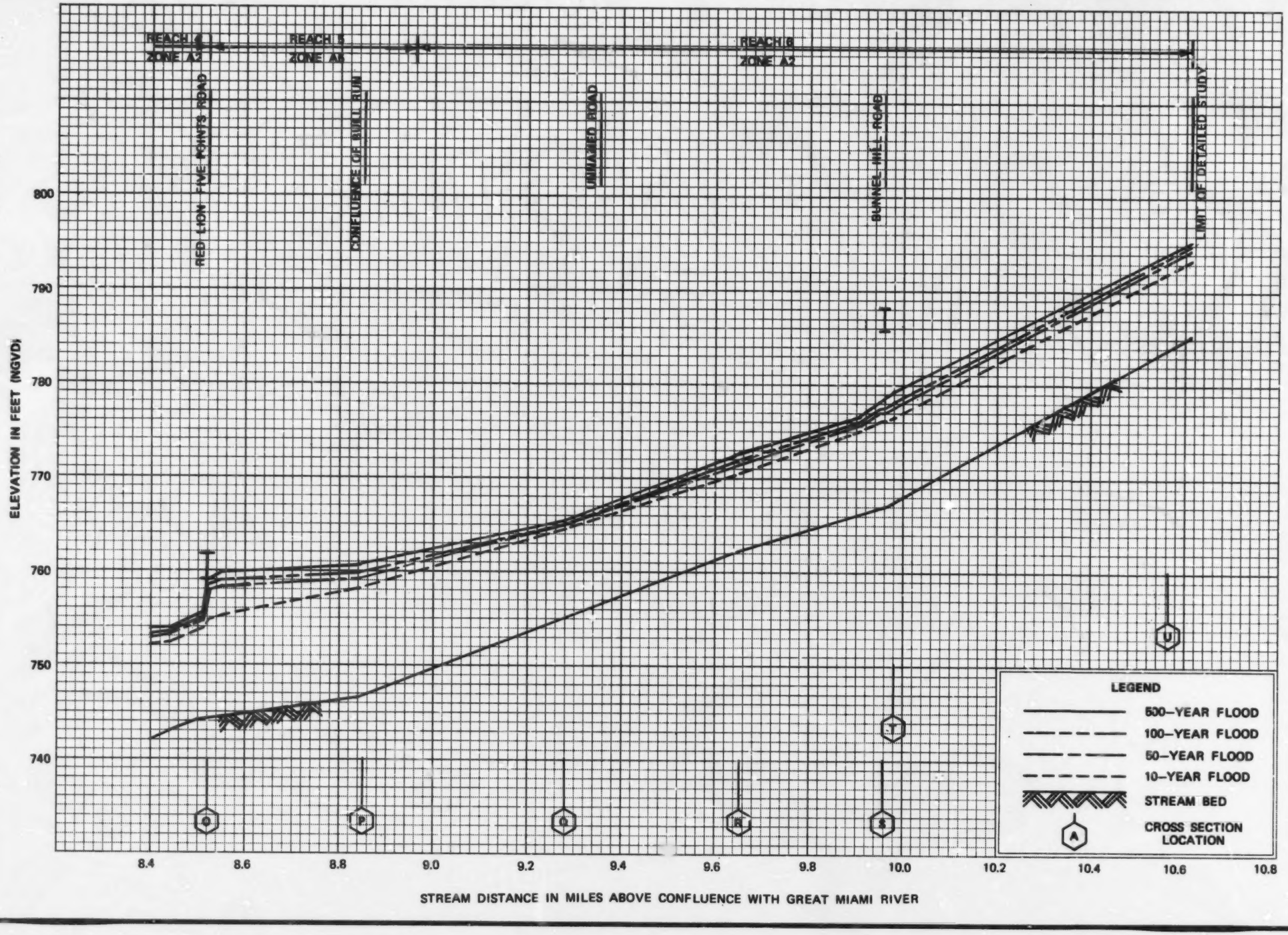

FLOOD PROFILES

CLEAR CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

19P

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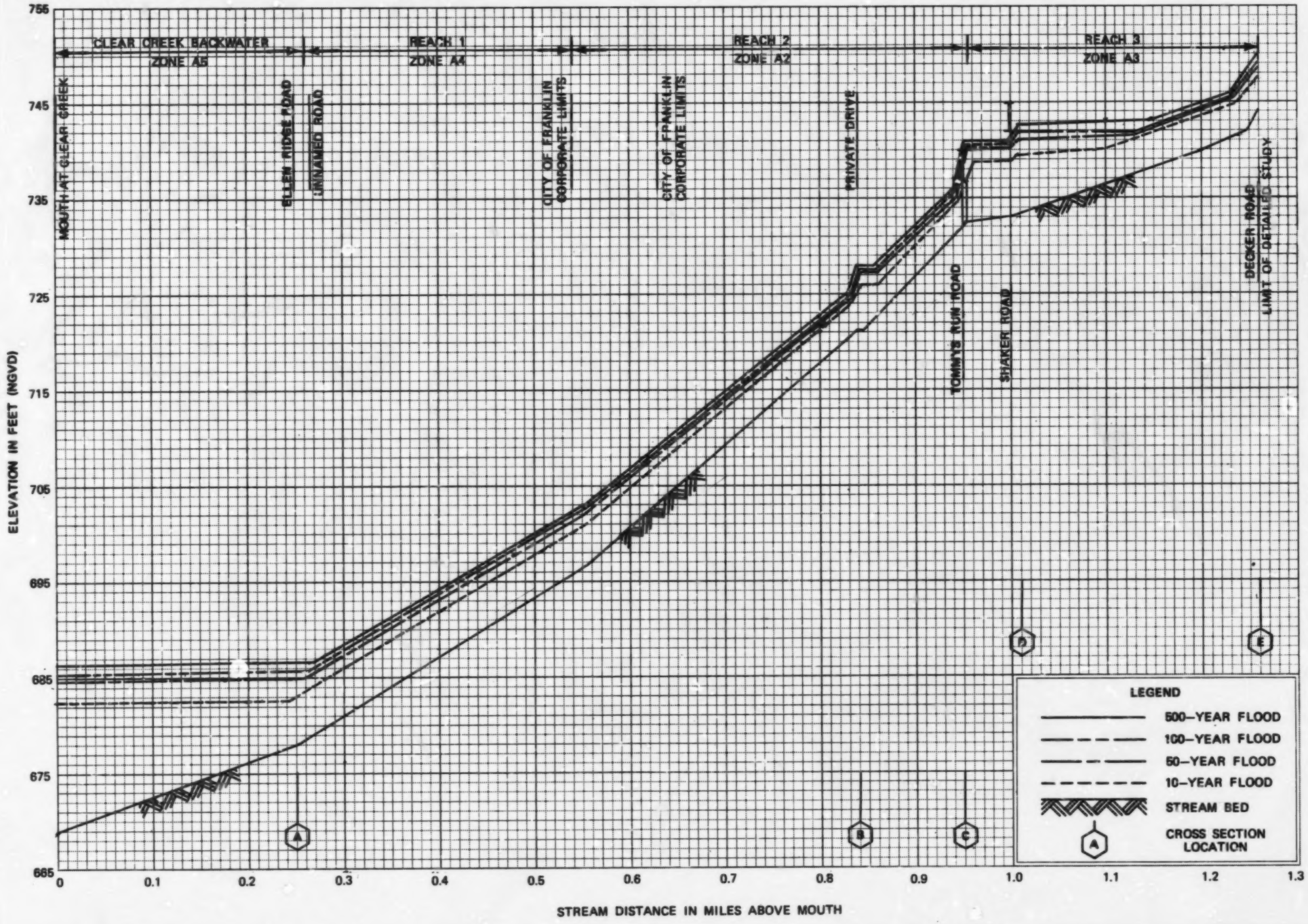


FLOOD PROFILES

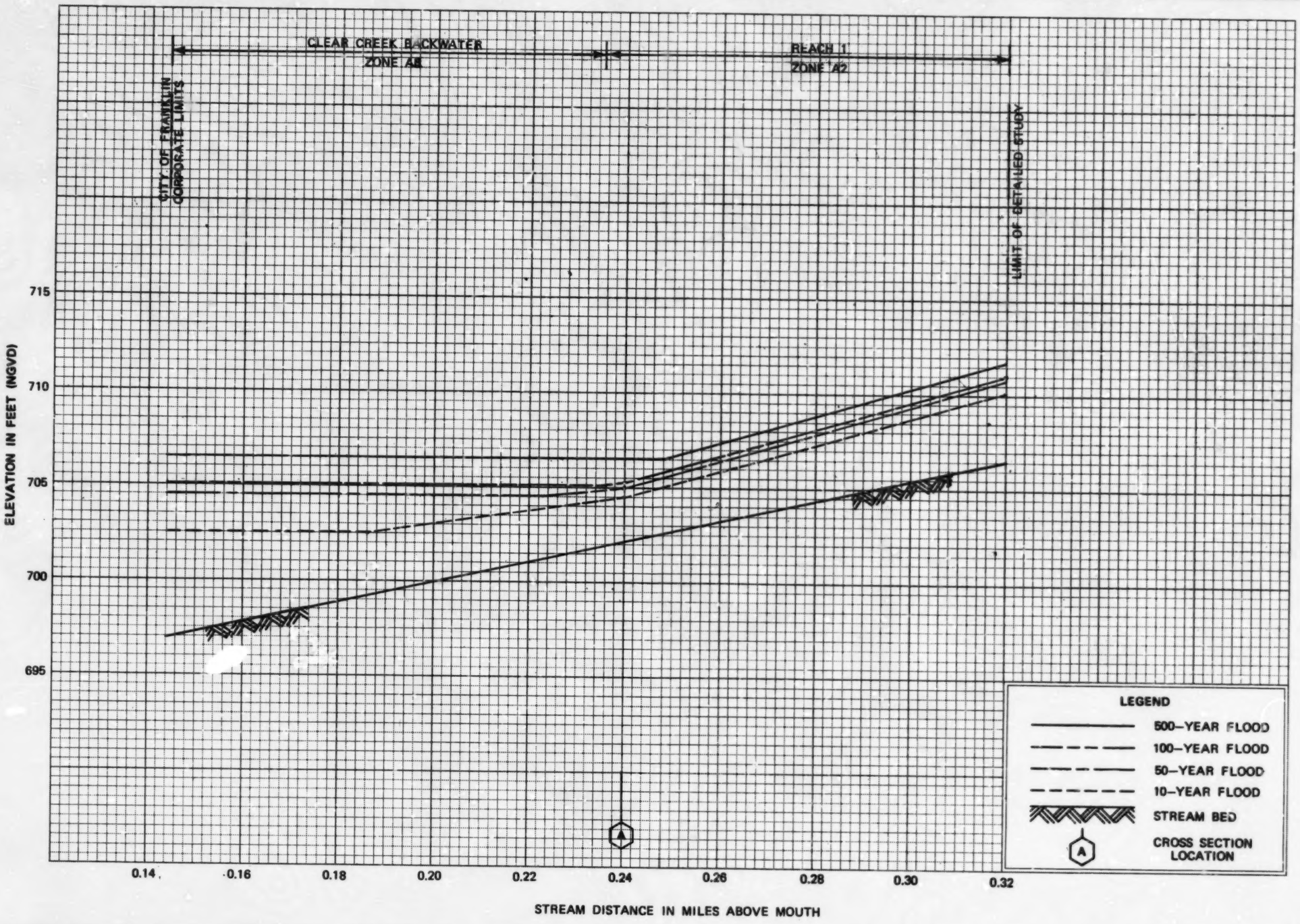
TOMMYS RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

20P

BEST COPY AVAILABLE



FLOOD PROFILES

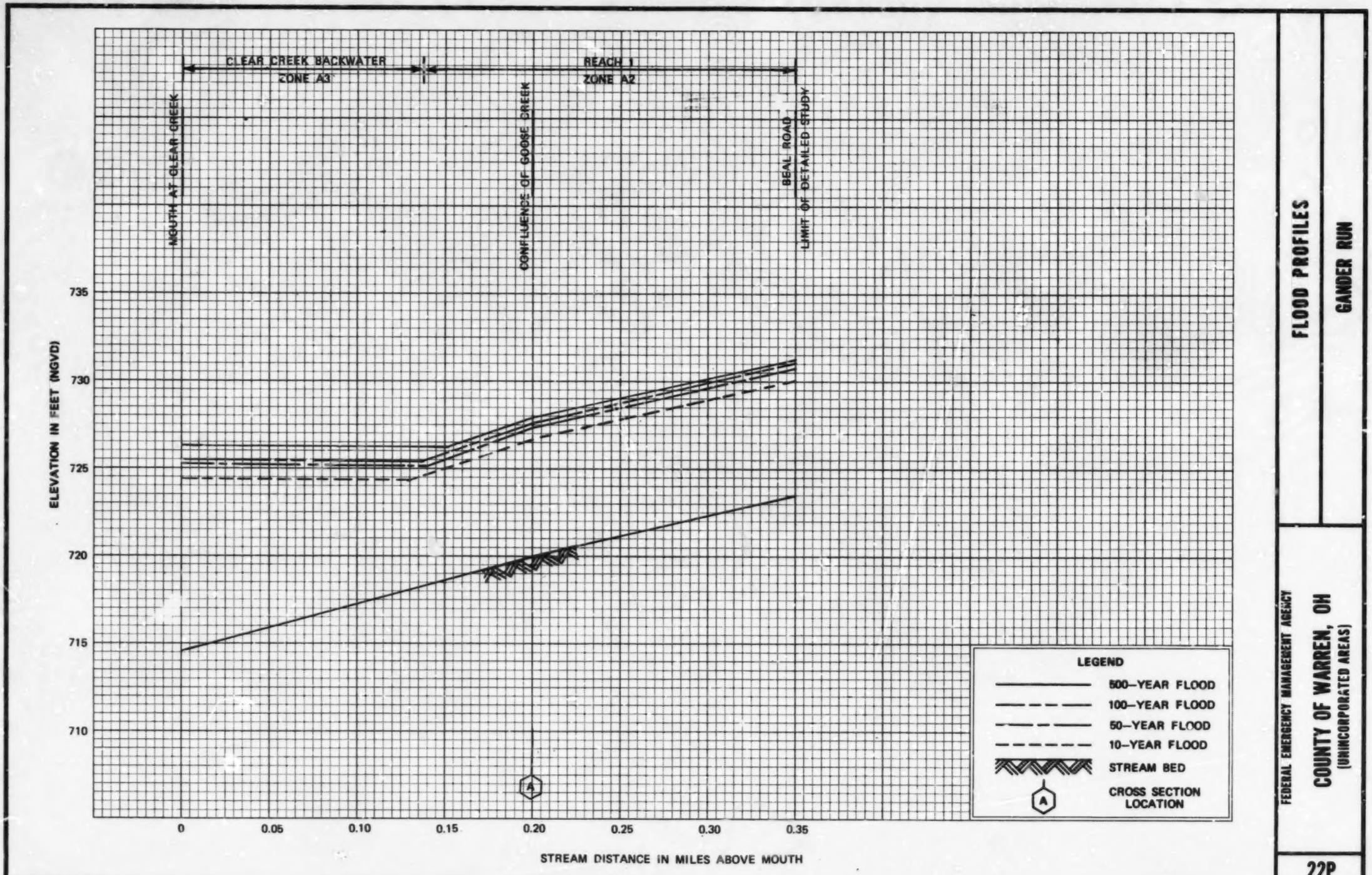
SHARTS BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

21P

BEST COPY AVAILABLE



FLOOD PROFILES

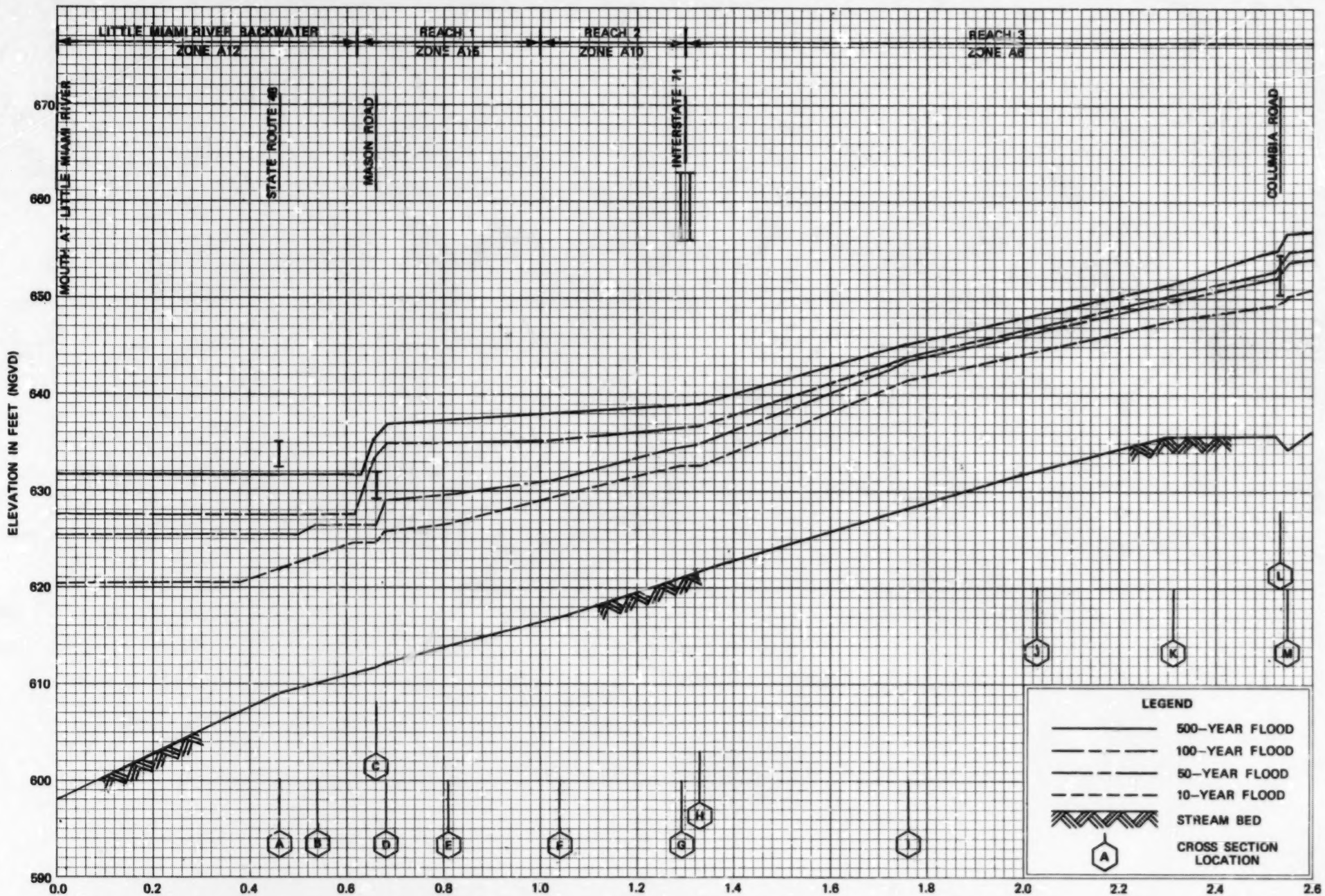
GANDER RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

22P

BEST COPY AVAILABLE



FLOOD PROFILES

TURTLE CREEK

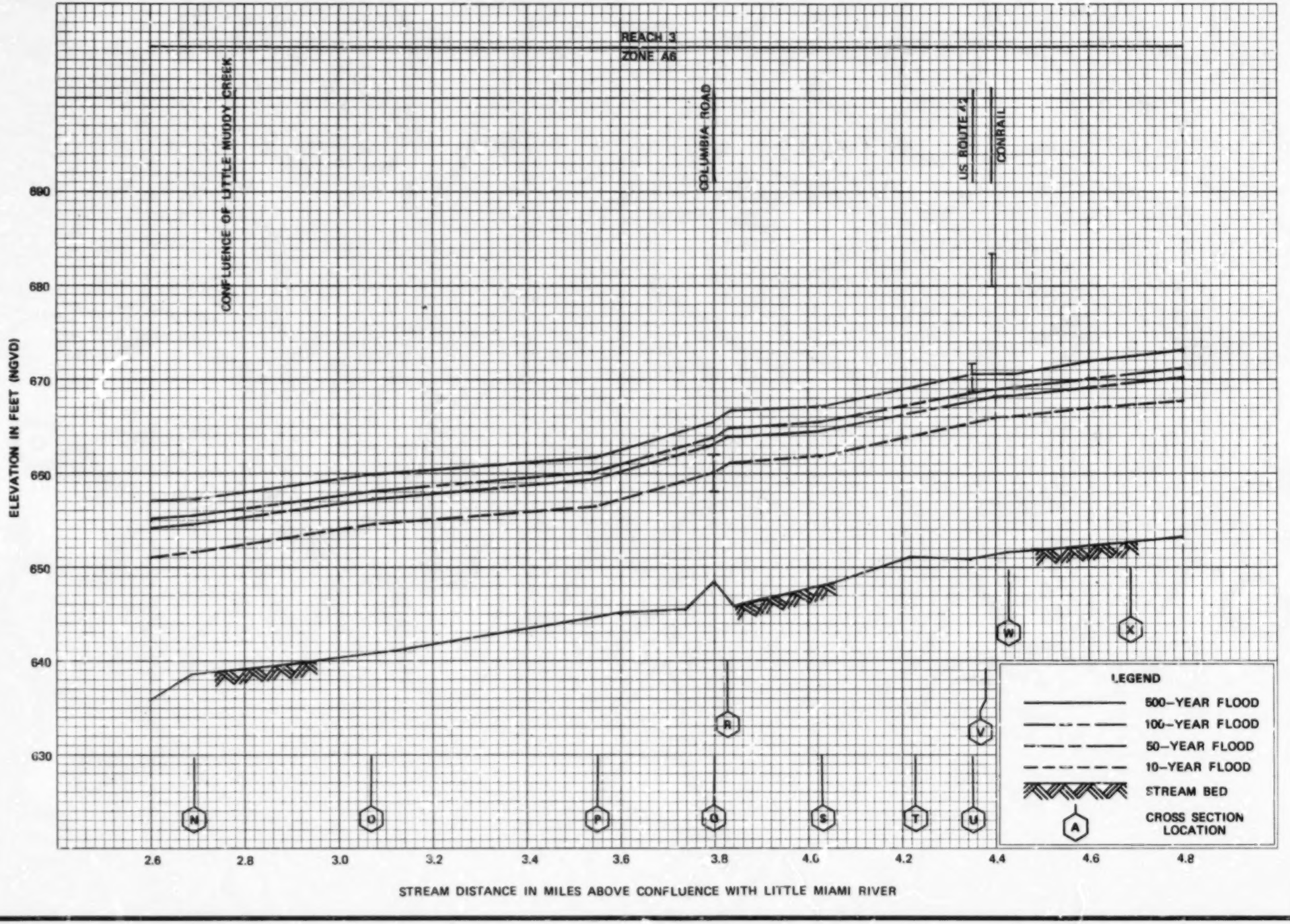
FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

23P

8/

BEST COPY AVAILABLE



FLOOD PROFILES

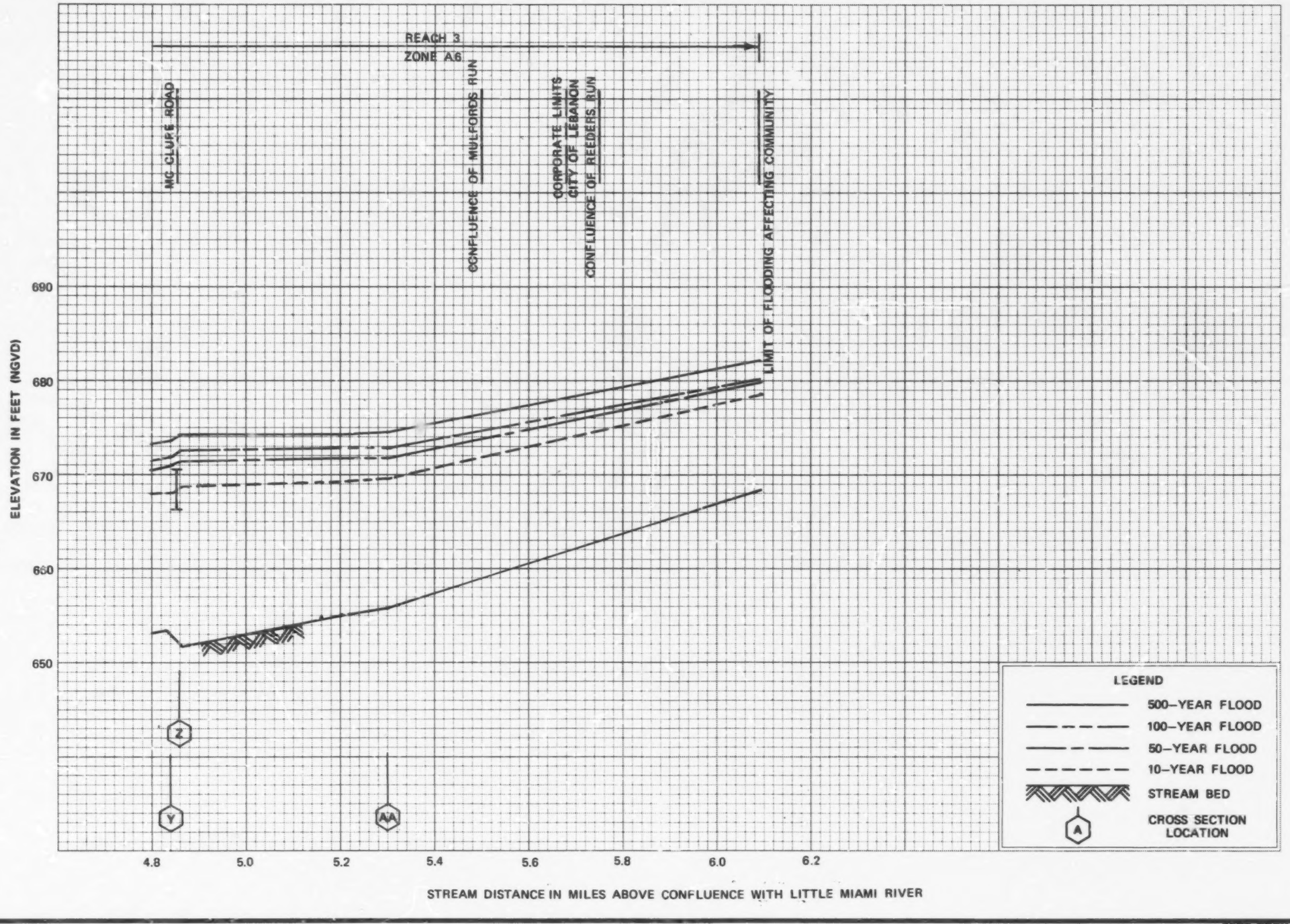
TURTLE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

24P

BEST COPY AVAILABLE



FLOOD PROFILES

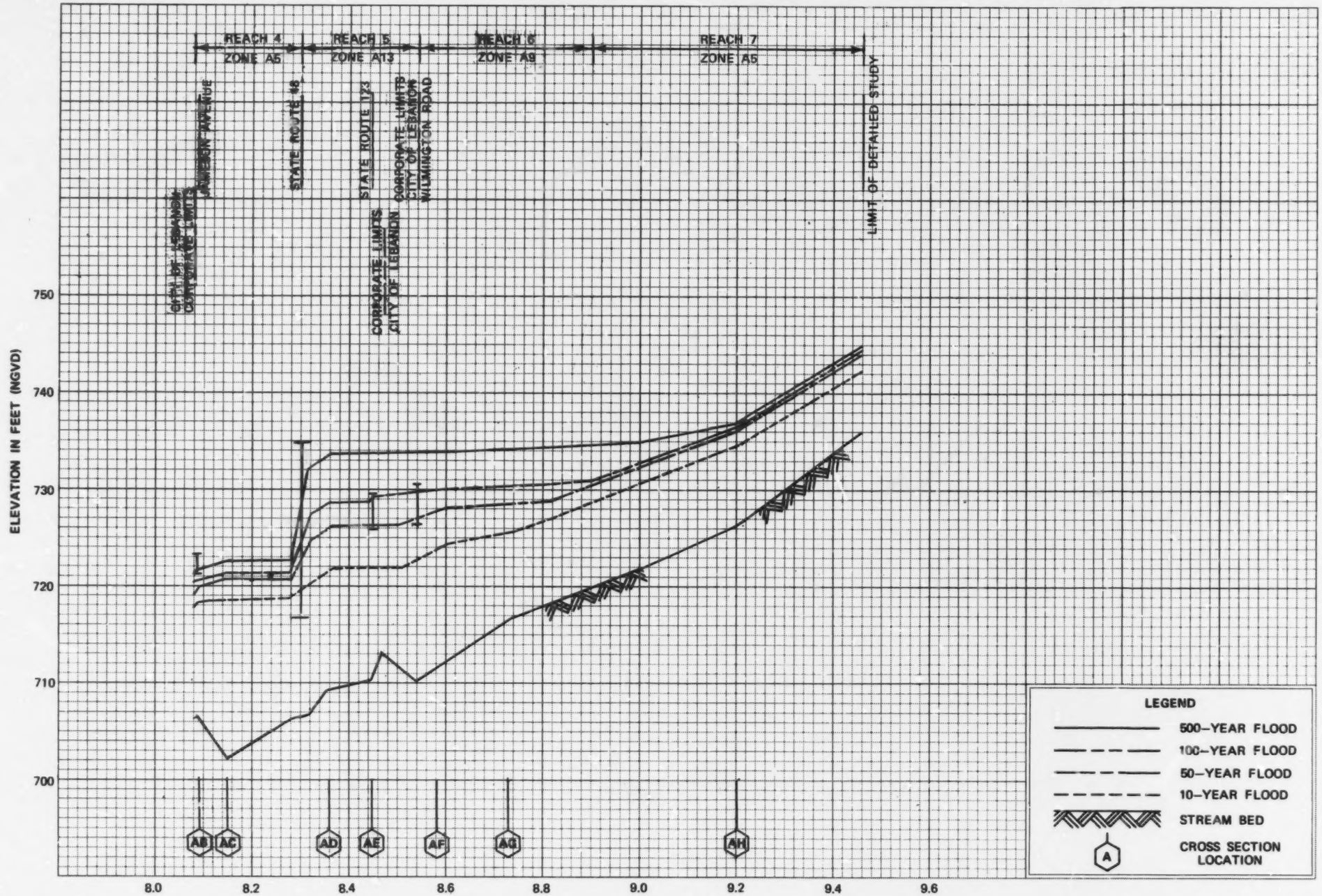
TURTLE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

25P

BEST COPY AVAILABLE



FLOOD PROFILES

TURTLE CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

26P

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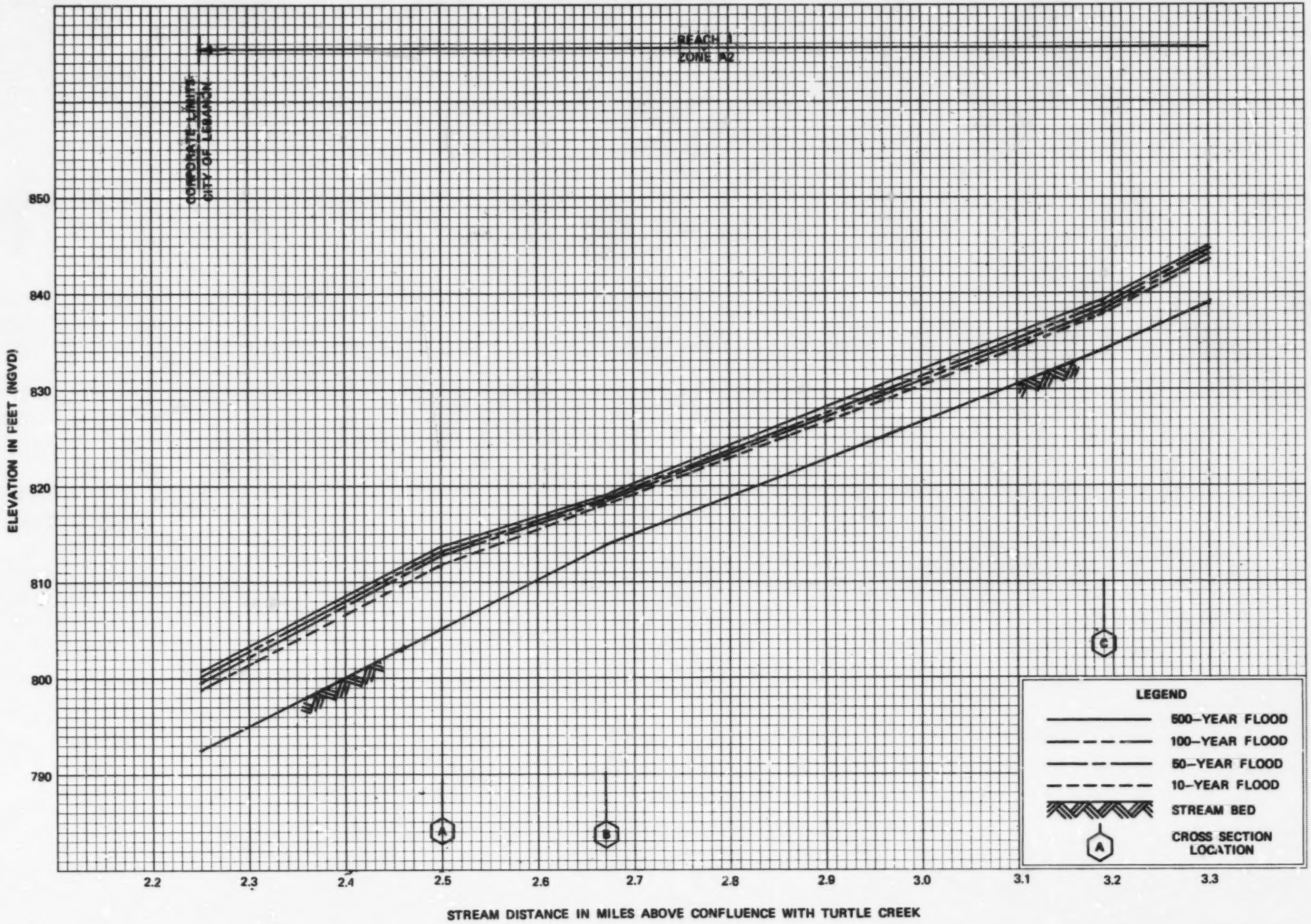


FLOOD PROFILES

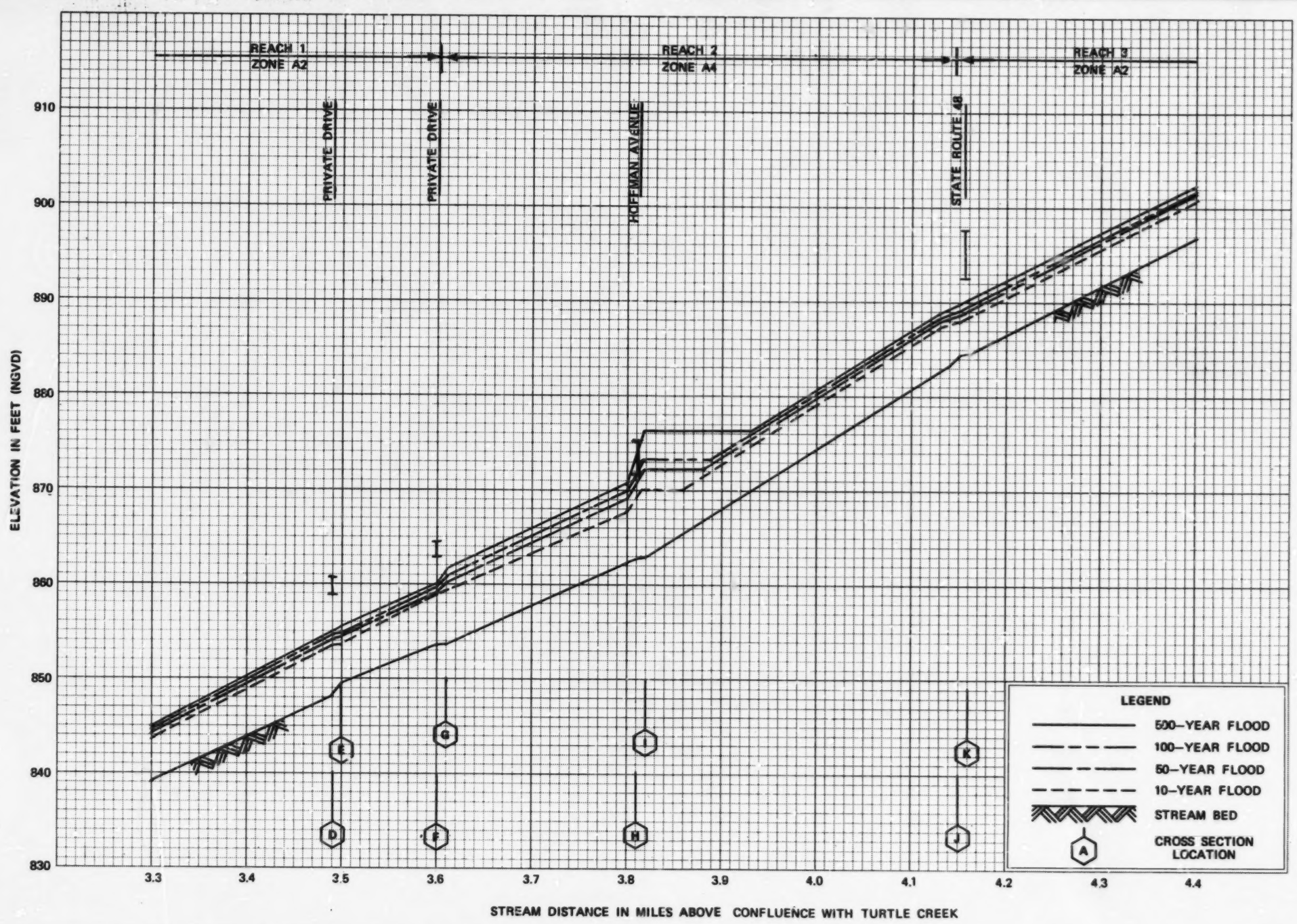
NORTH FORK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

27P

BEST COPY AVAILABLE



FLOOD PROFILES

NORTH FORK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

28P

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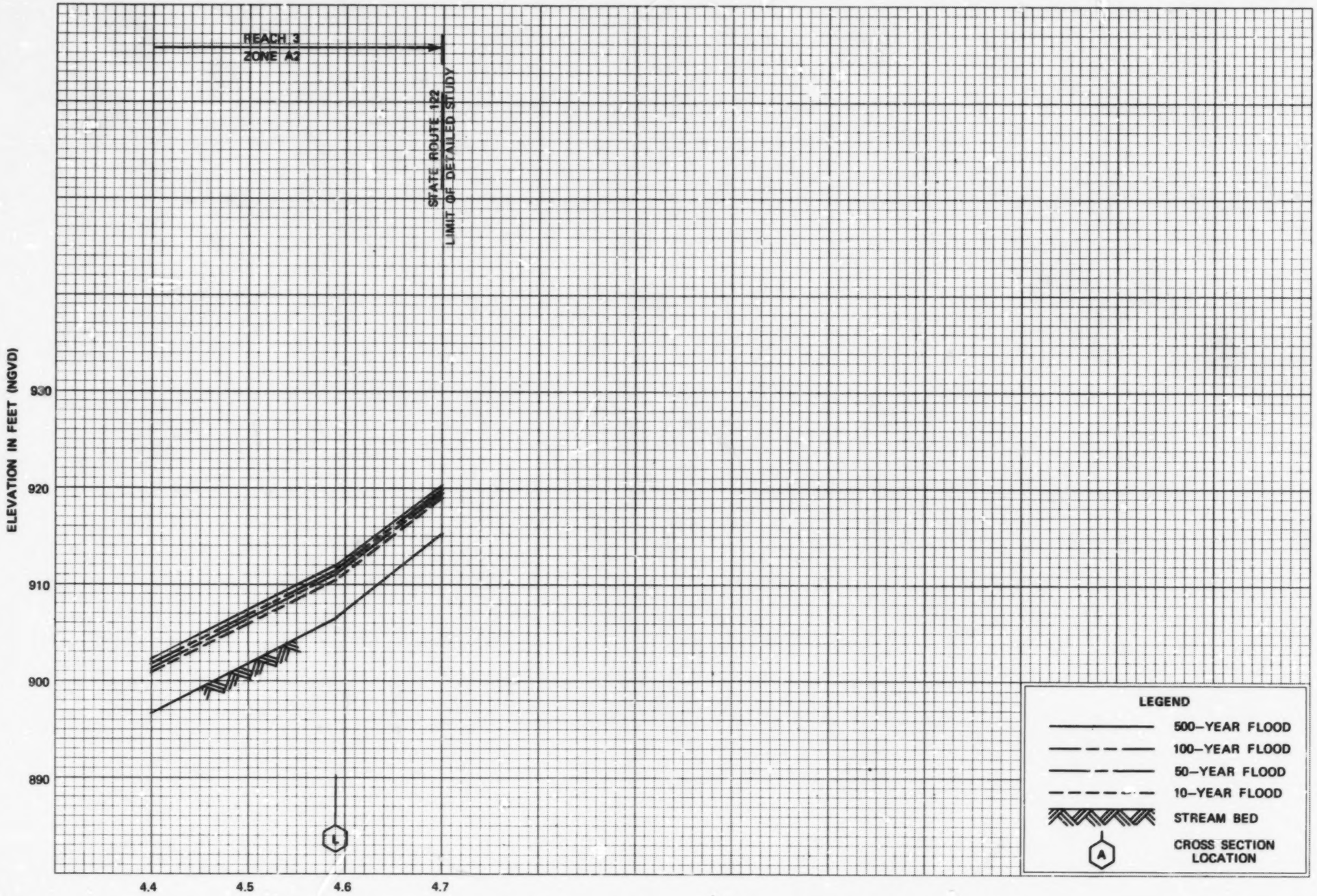

FLOOD PROFILES

NORTH FORK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

29P

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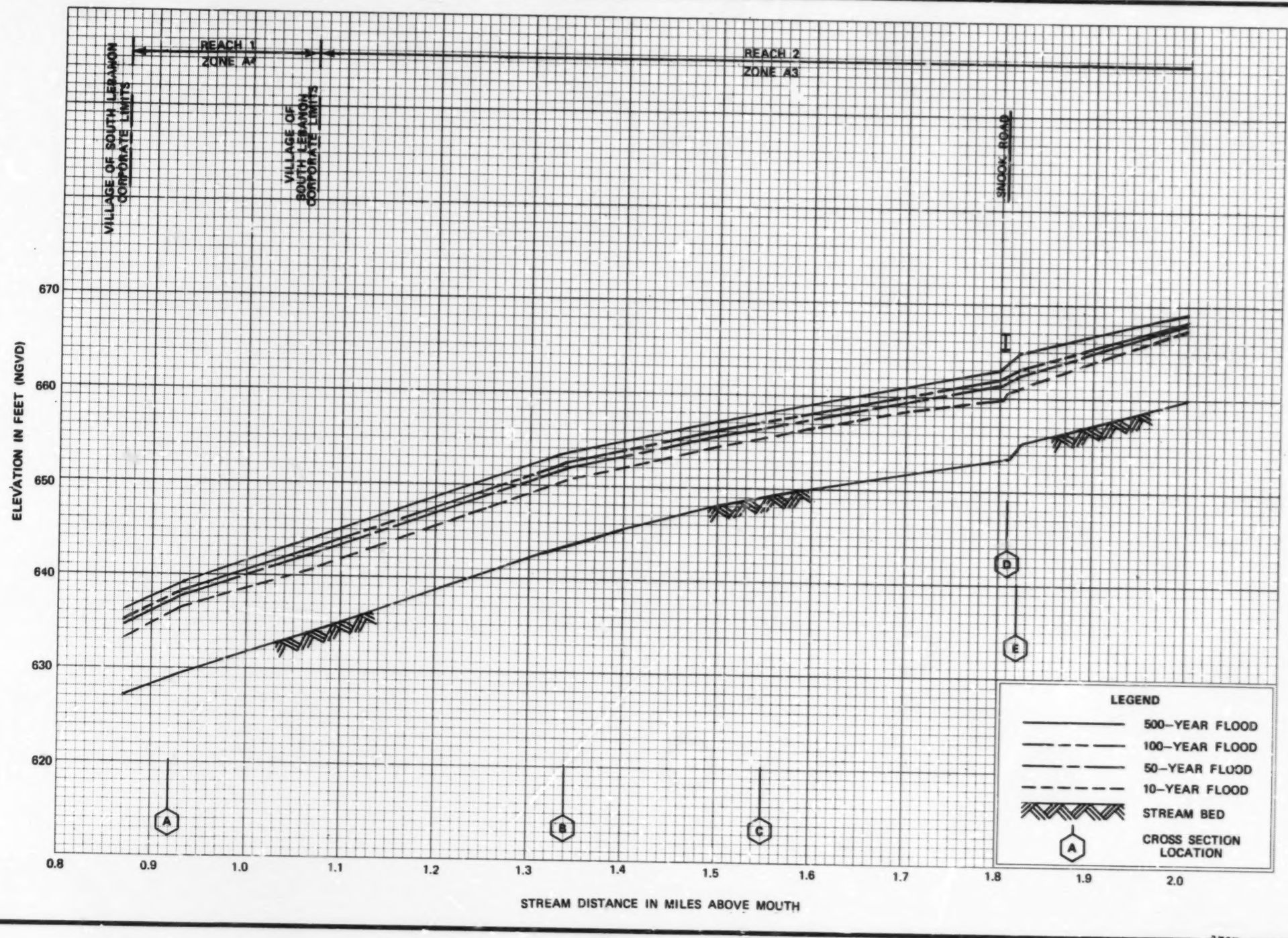


FLOOD PROFILES

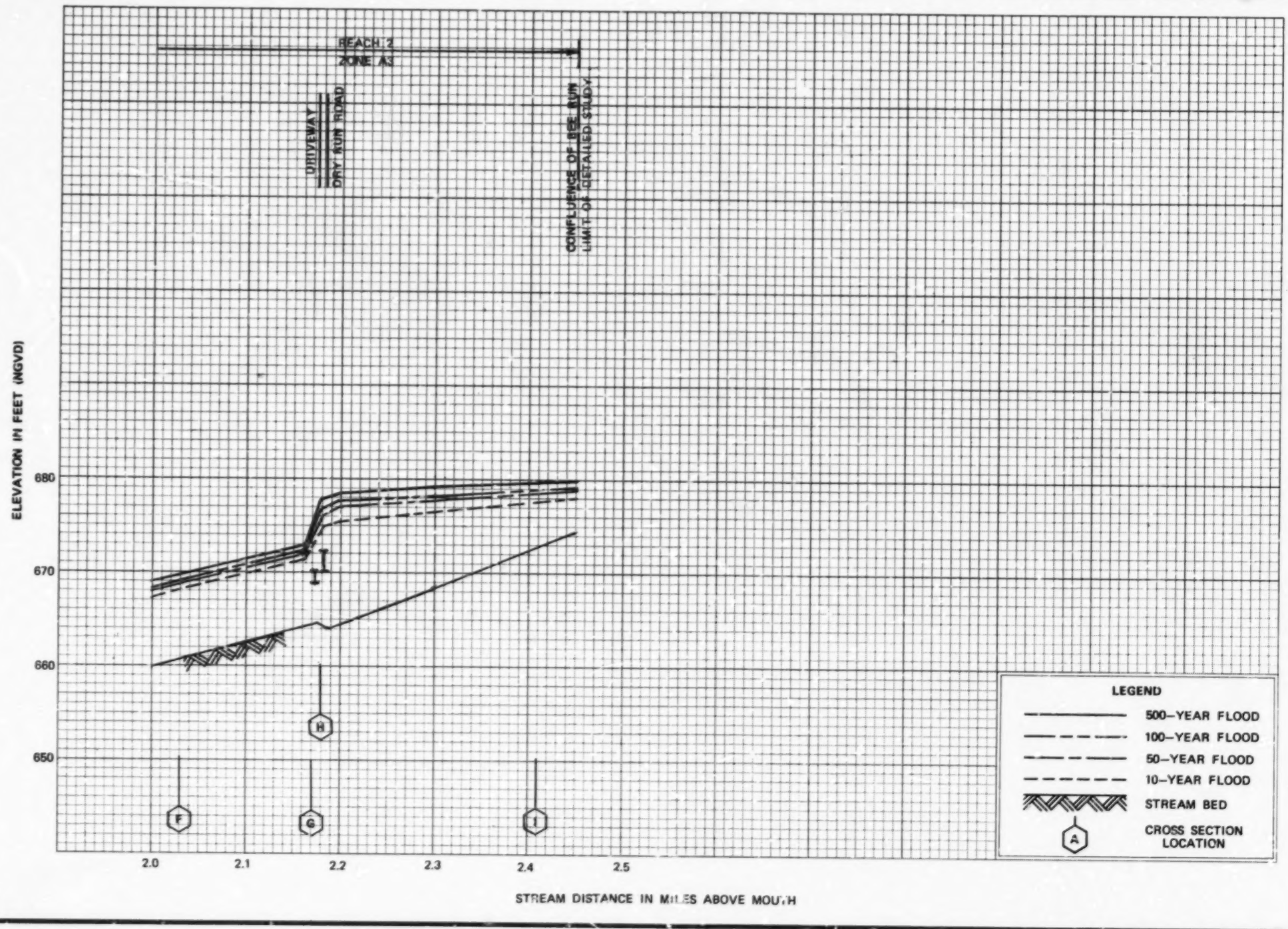
DRY RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

30P

BEST COPY AVAILABLE



FLOOD PROFILES

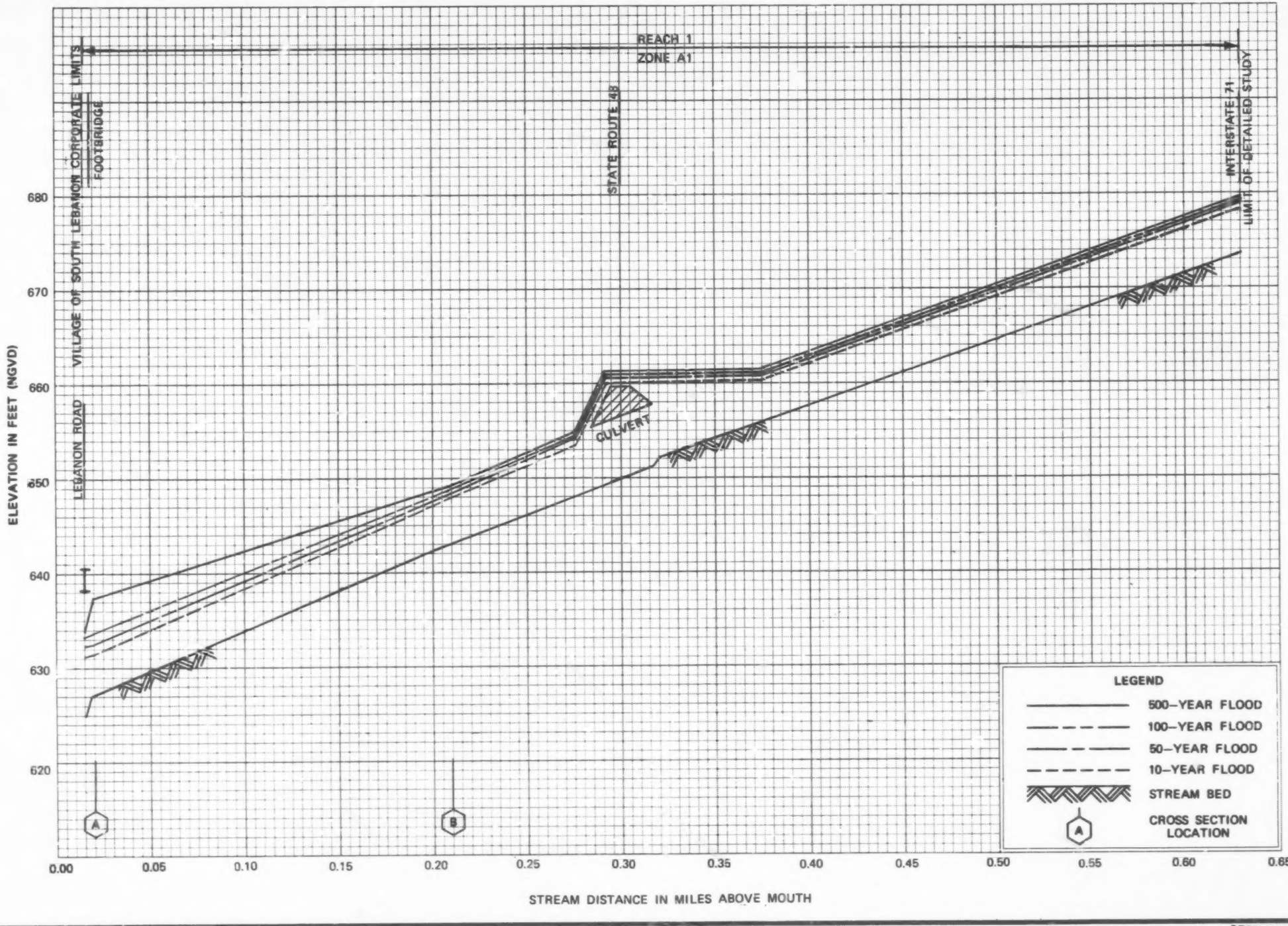
DRY RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

31P

BEST COPY AVAILABLE



FLOOD PROFILES

DRY RUN BRANCH

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

32P

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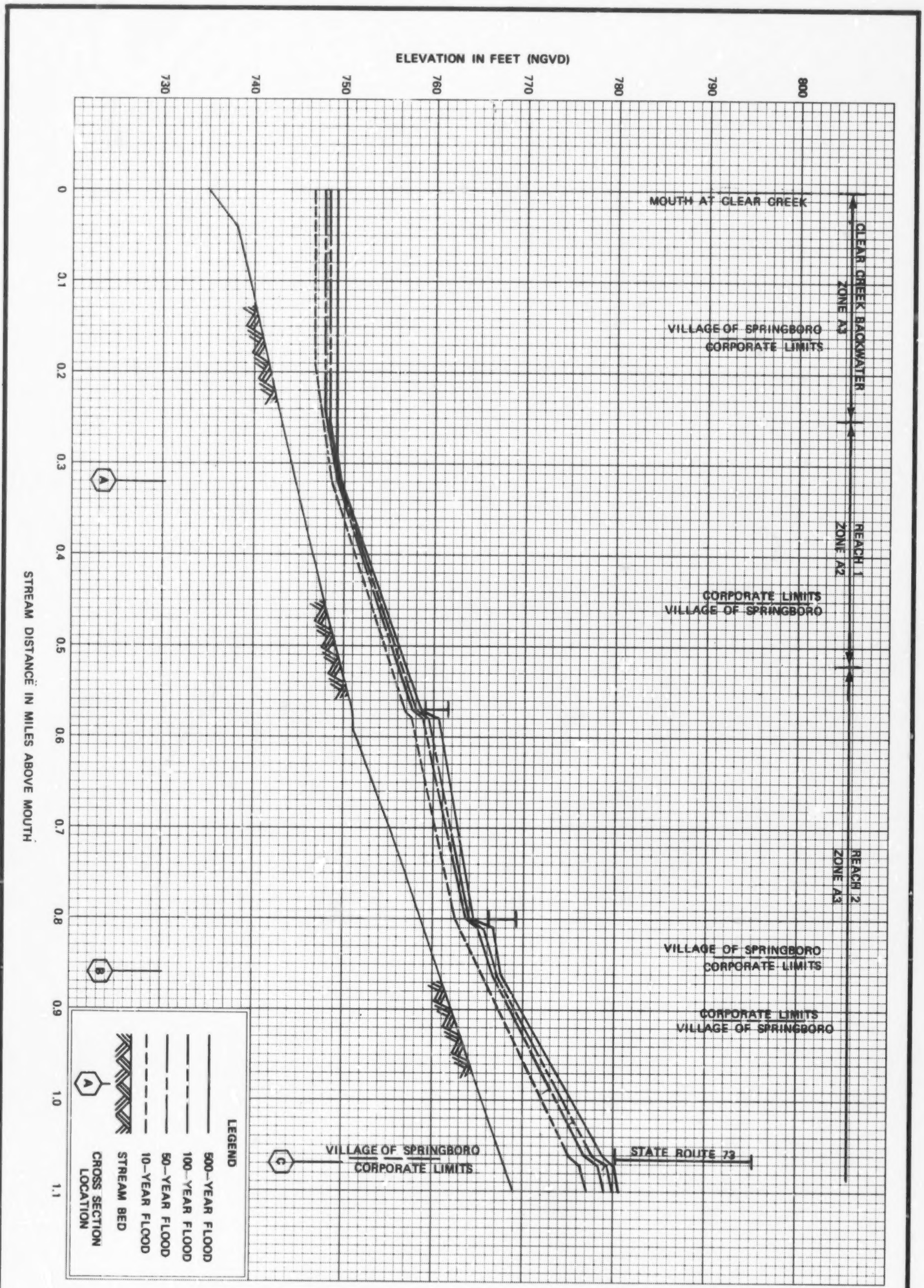


FEDERAL EMERGENCY MANAGEMENT AGENCY

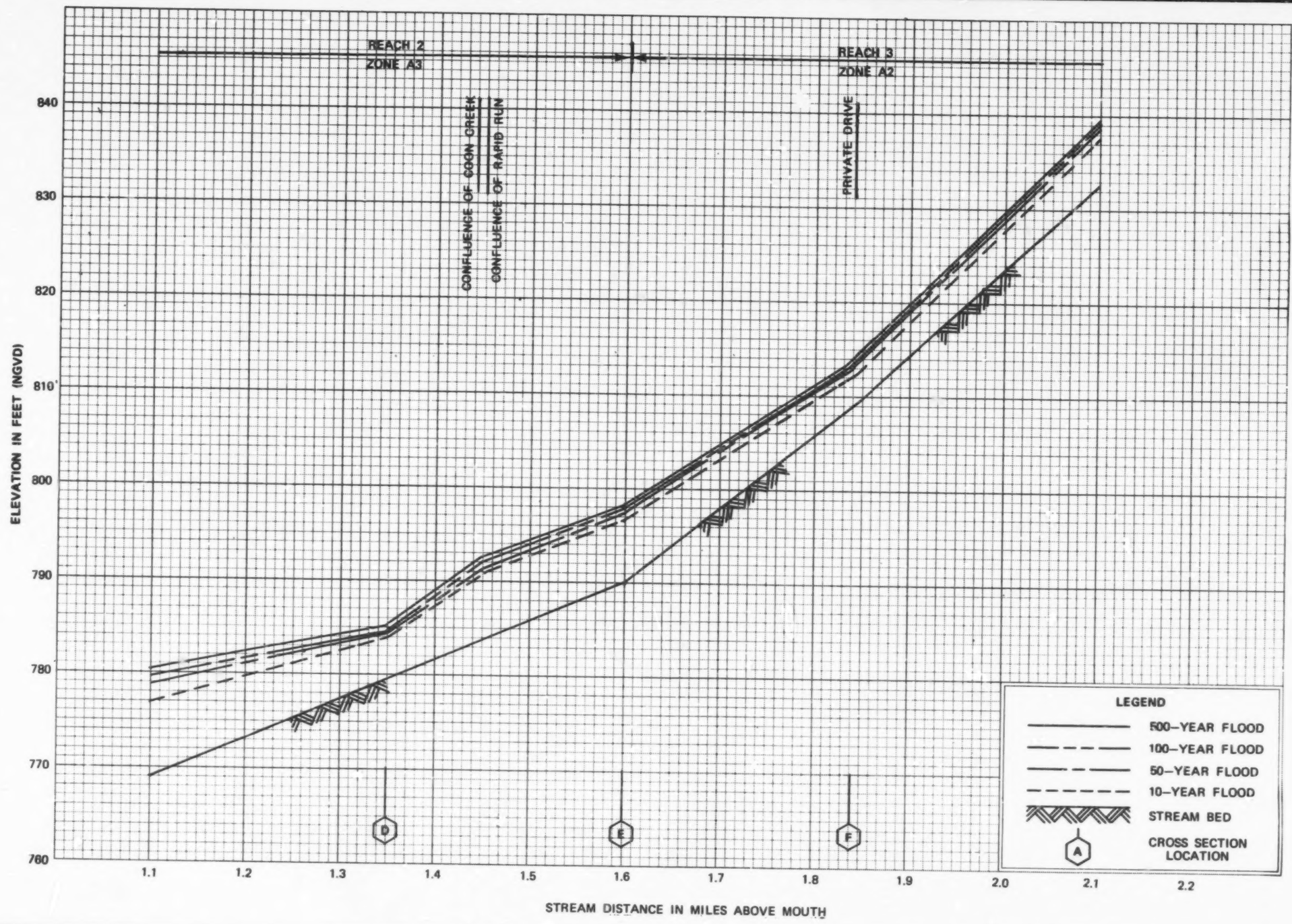
COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

FLOOD PROFILES

RICHARDS RUN

33P

BEST COPY AVAILABLE



FLOOD PROFILES

RICHARDS RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

34P

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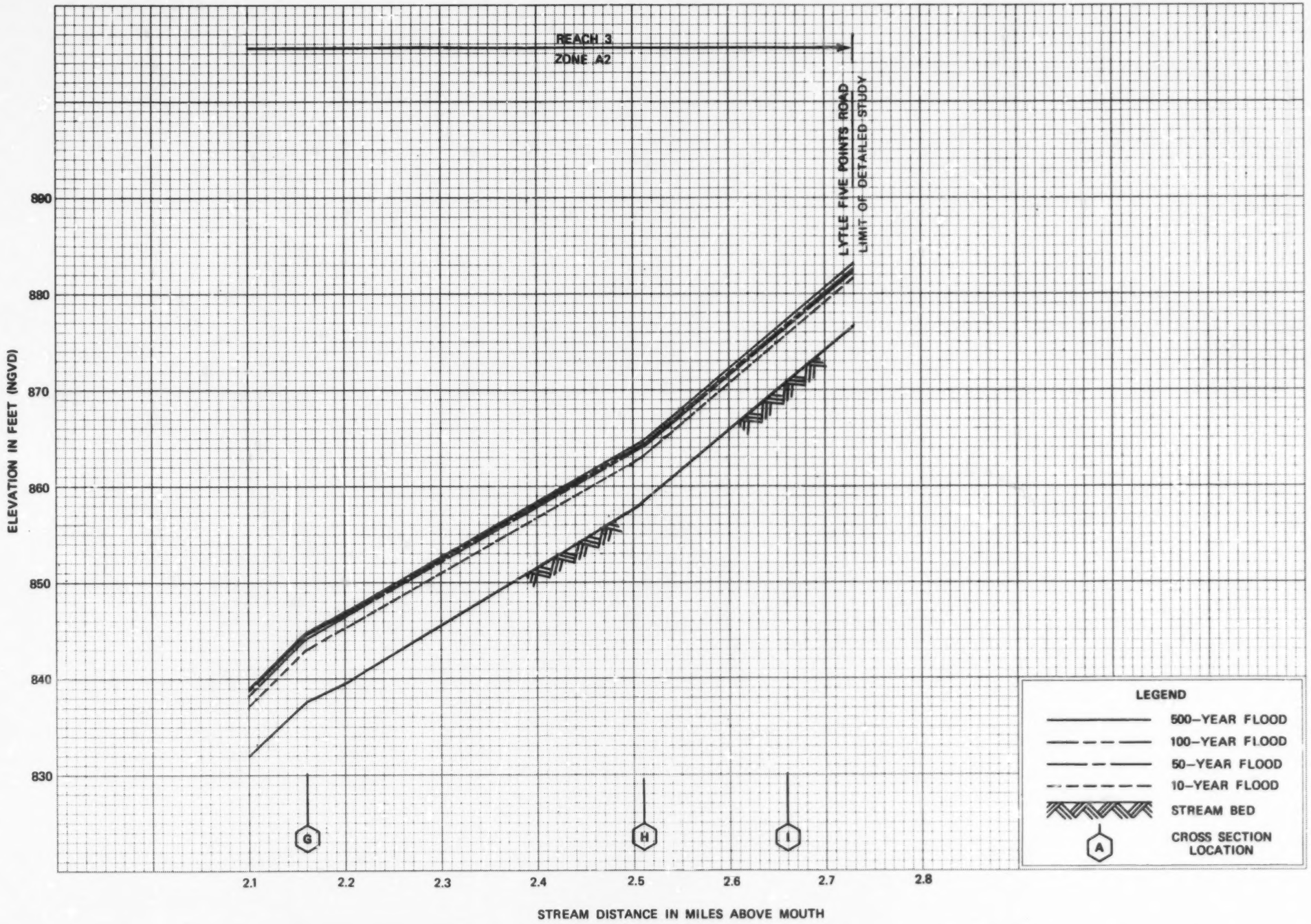


FLOOD PROFILES

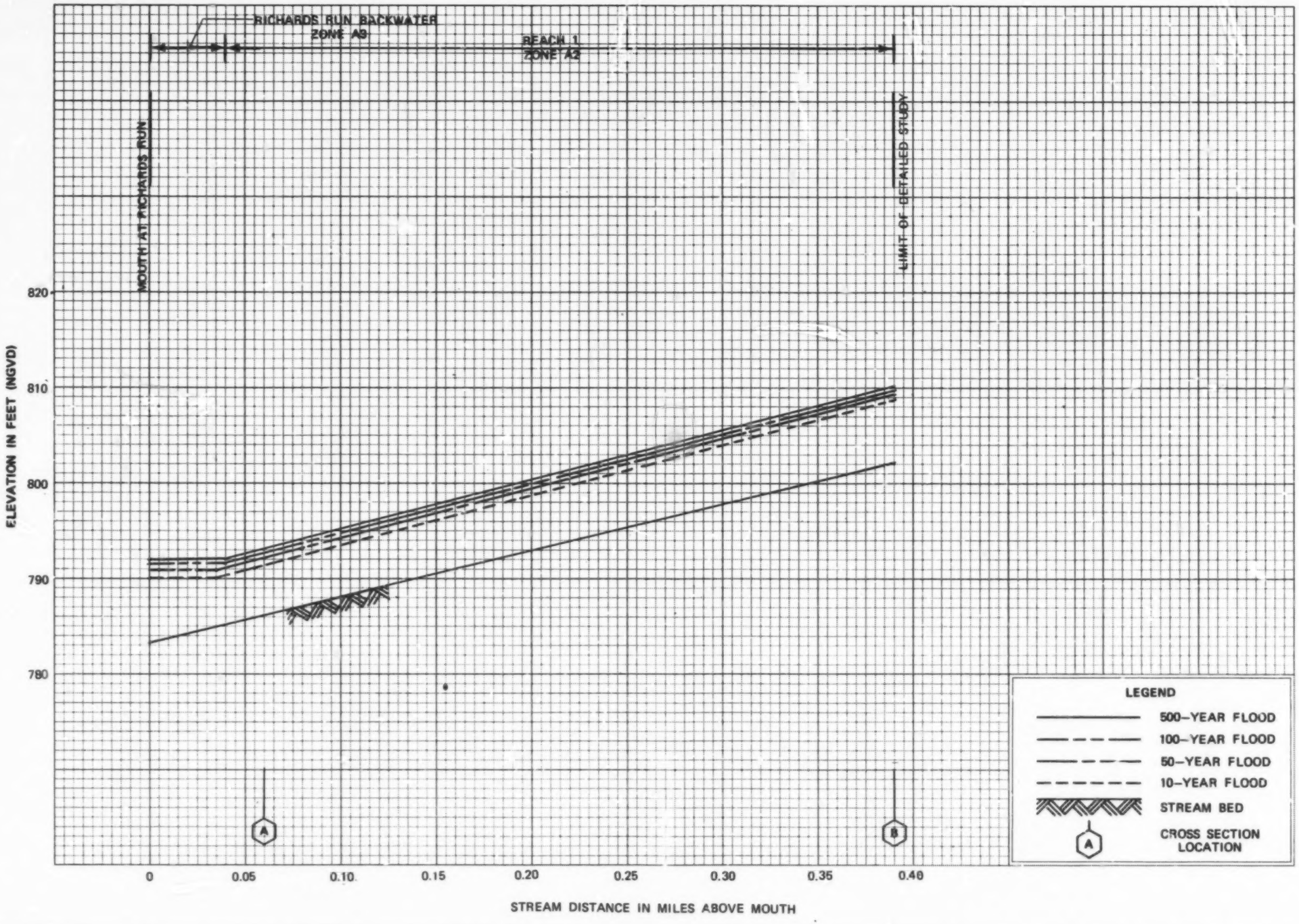
RICHARDS RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

35P

BEST COPY AVAILABLE



FLOOD PROFILES

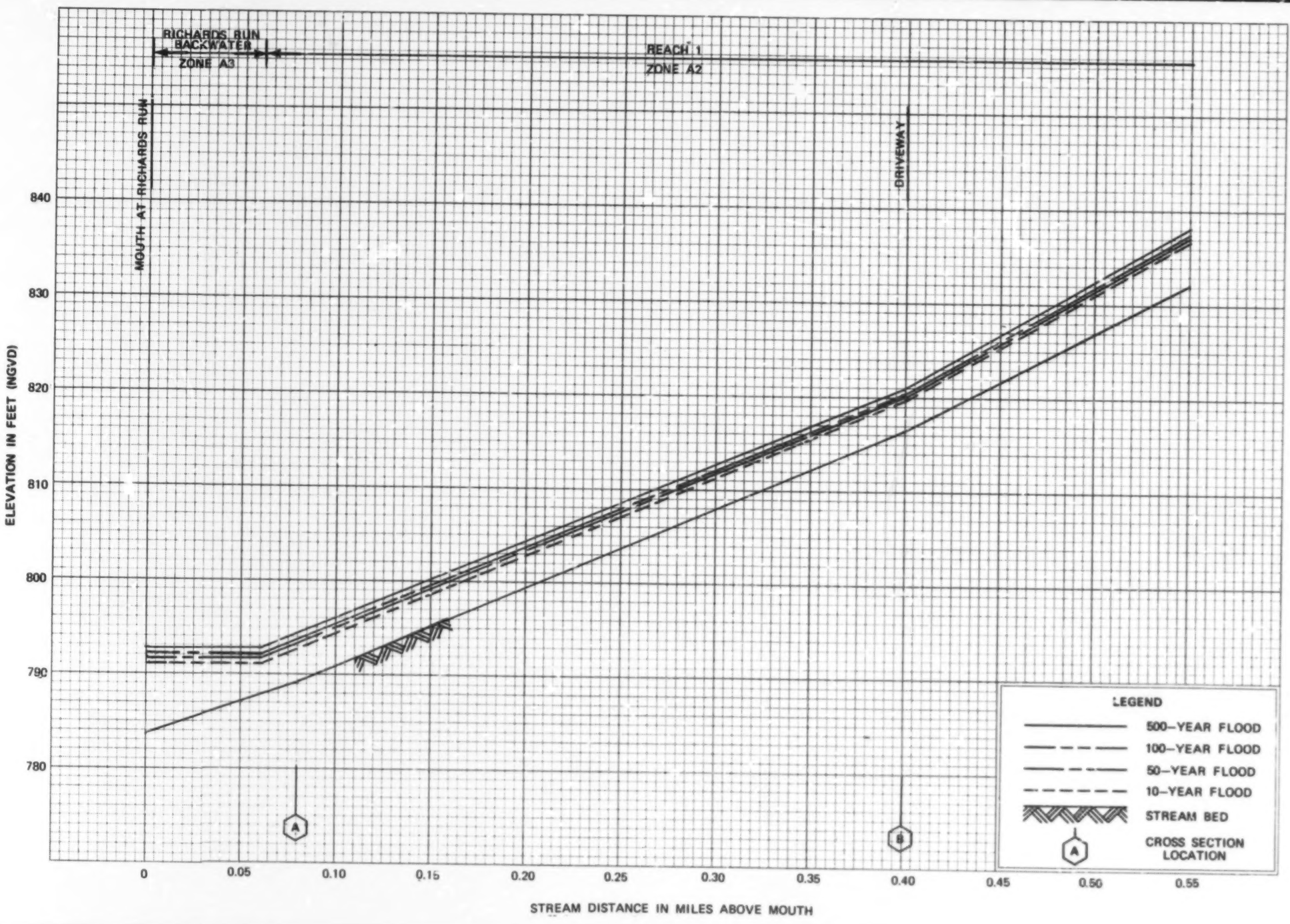
COGN CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

36P

BEST COPY AVAILABLE



FLOOD PROFILES

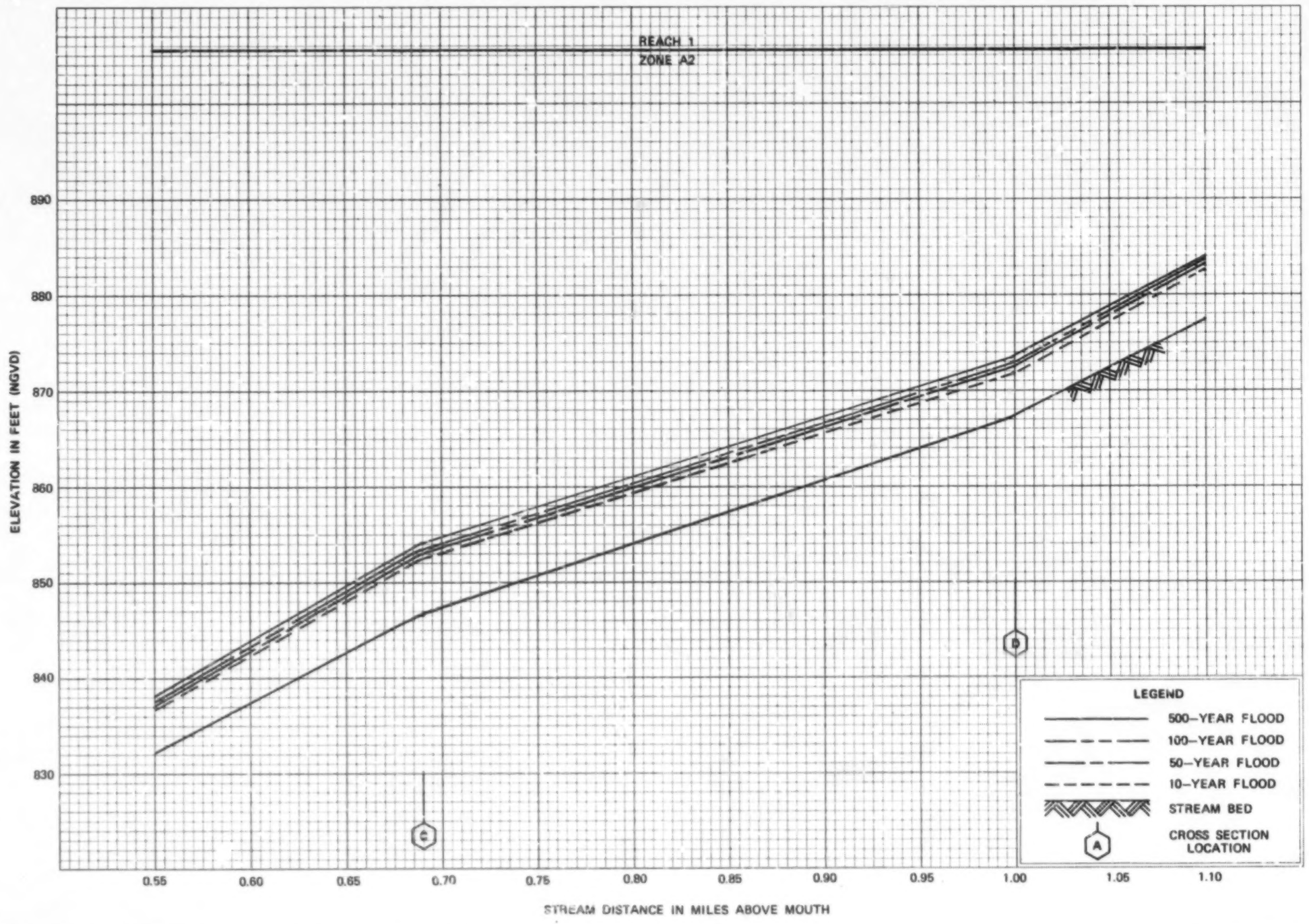
RAPID RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

37P

BEST COPY AVAILABLE



FLOOD PROFILES

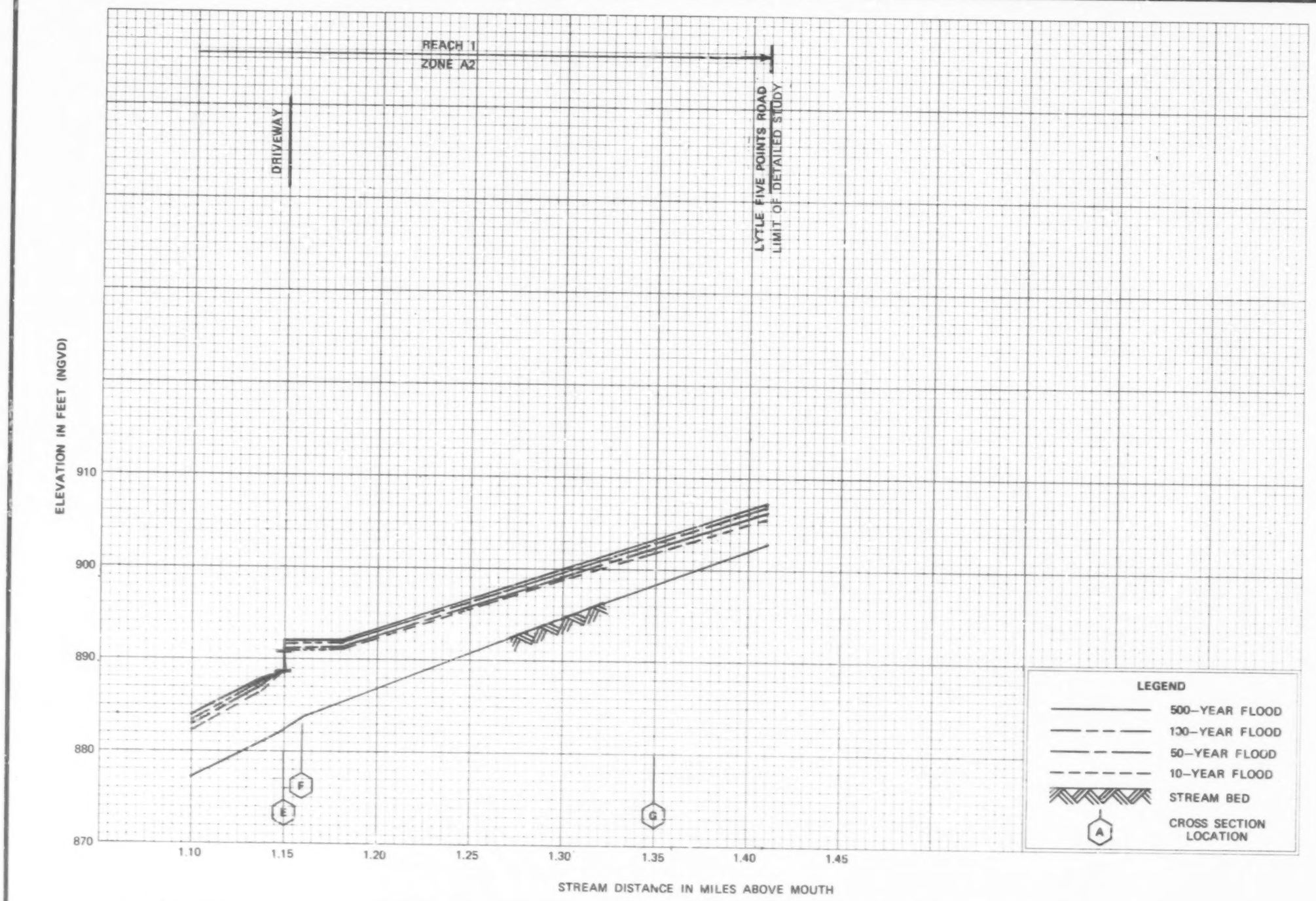
RAPID RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

38P

BEST COPY AVAILABLE



FLOOD PROFILES

RAPID RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

39P

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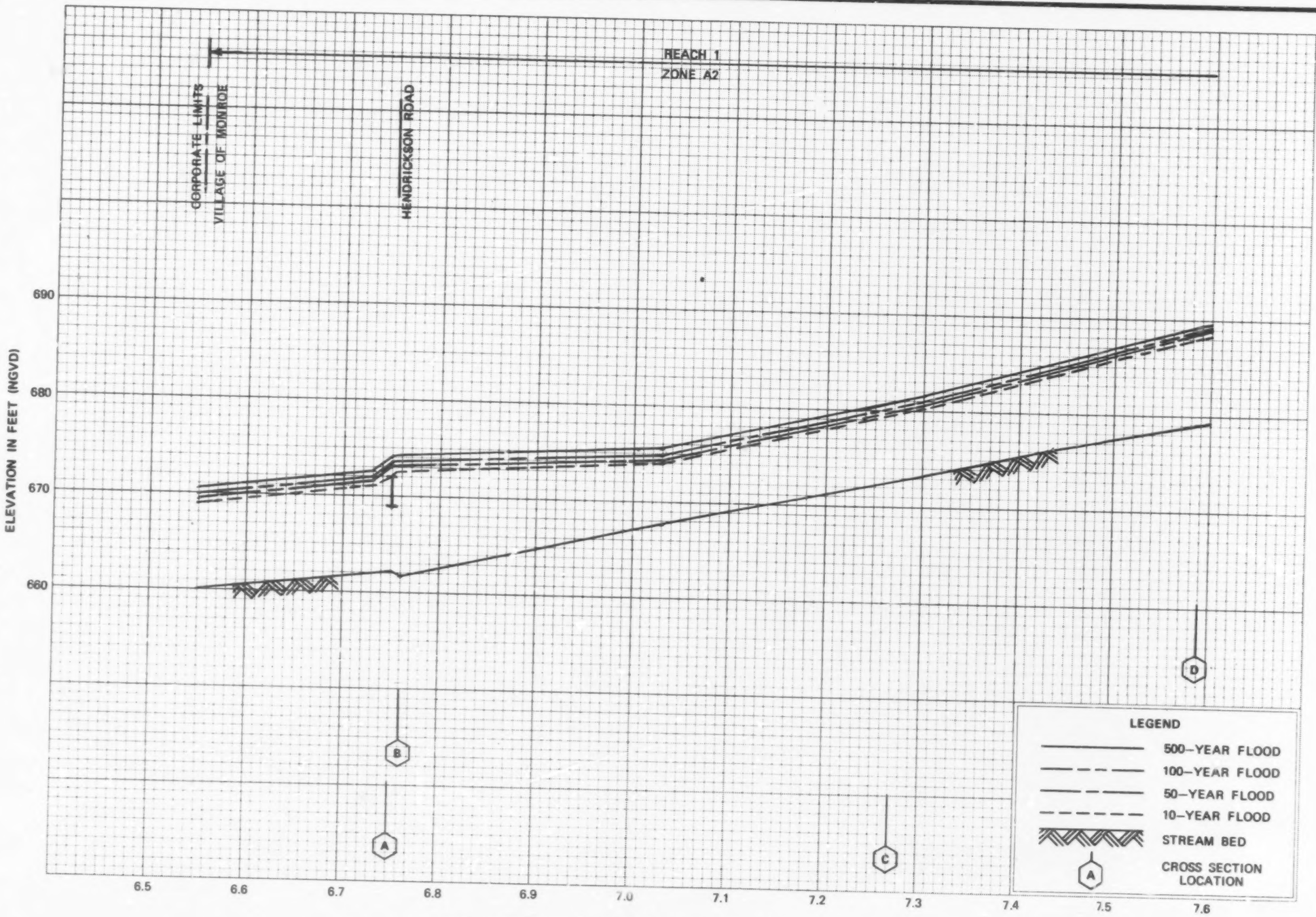

FLOOD PROFILES

DICKS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

40P

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REACH 1
ZONE A2

RAMP SOUTHBOUND INTERSTATE 75
NORTHBOUND INTERSTATE 75

STATE ROUTE 122

UNION ROAD

ELEVATION IN FEET (NGVD)

740
730
720
710
700
690
680
670

7.6 7.7 7.8 7.9 8.0 8.1 8.2 8.3 8.4 8.5 8.6 8.7

STREAM DISTANCE IN MILES ABOVE CONFLUENCE WITH GREAT MIAMI RIVER

III
I

LEGEND
- 500–YEAR FLOOD
- 100–YEAR FLOOD
- 50–YEAR FLOOD
- 10–YEAR FLOOD
- STREAM BED
- CROSS SECTION LOCATION (A)

FLOOD PROFILES

DICKS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

41P

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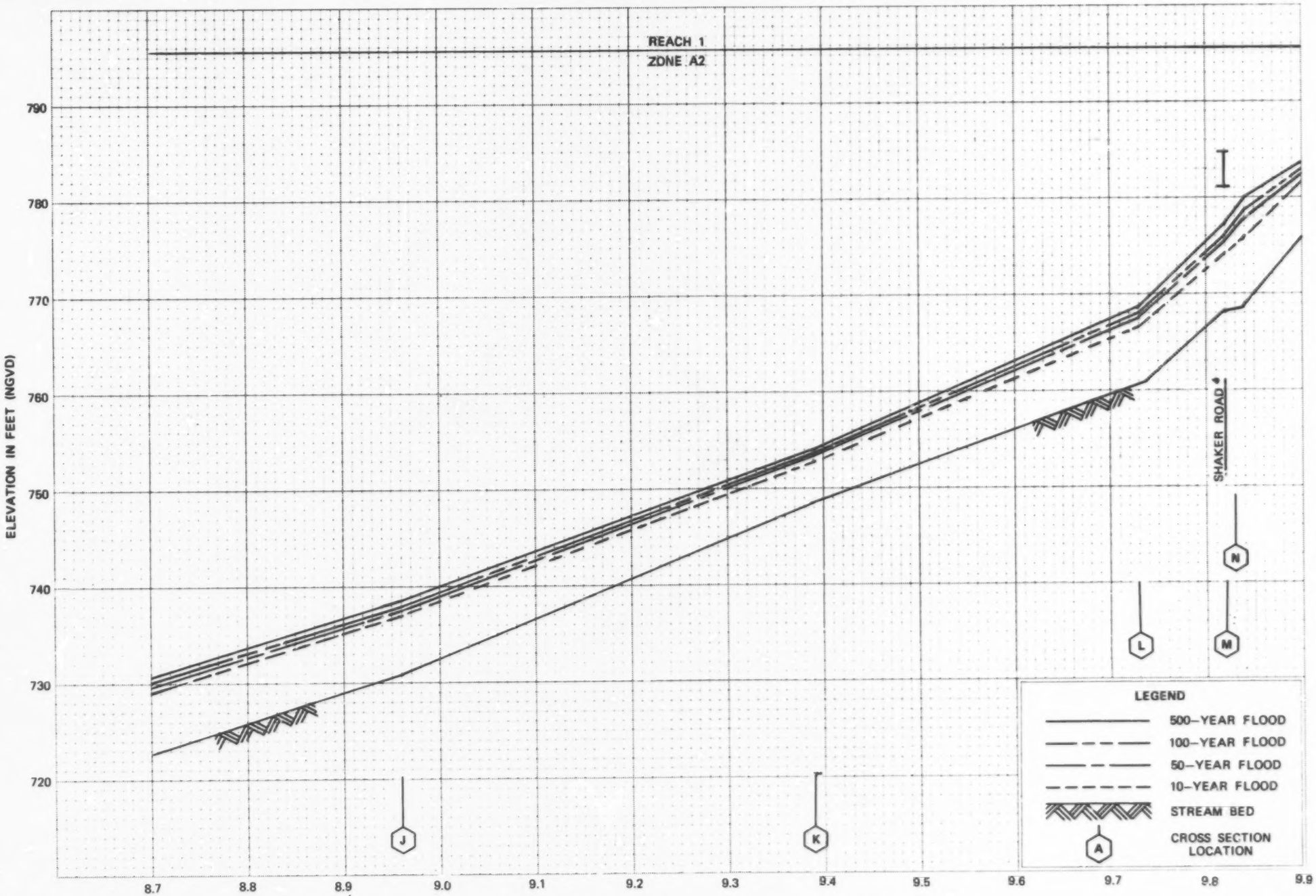


FLOOD PROFILES

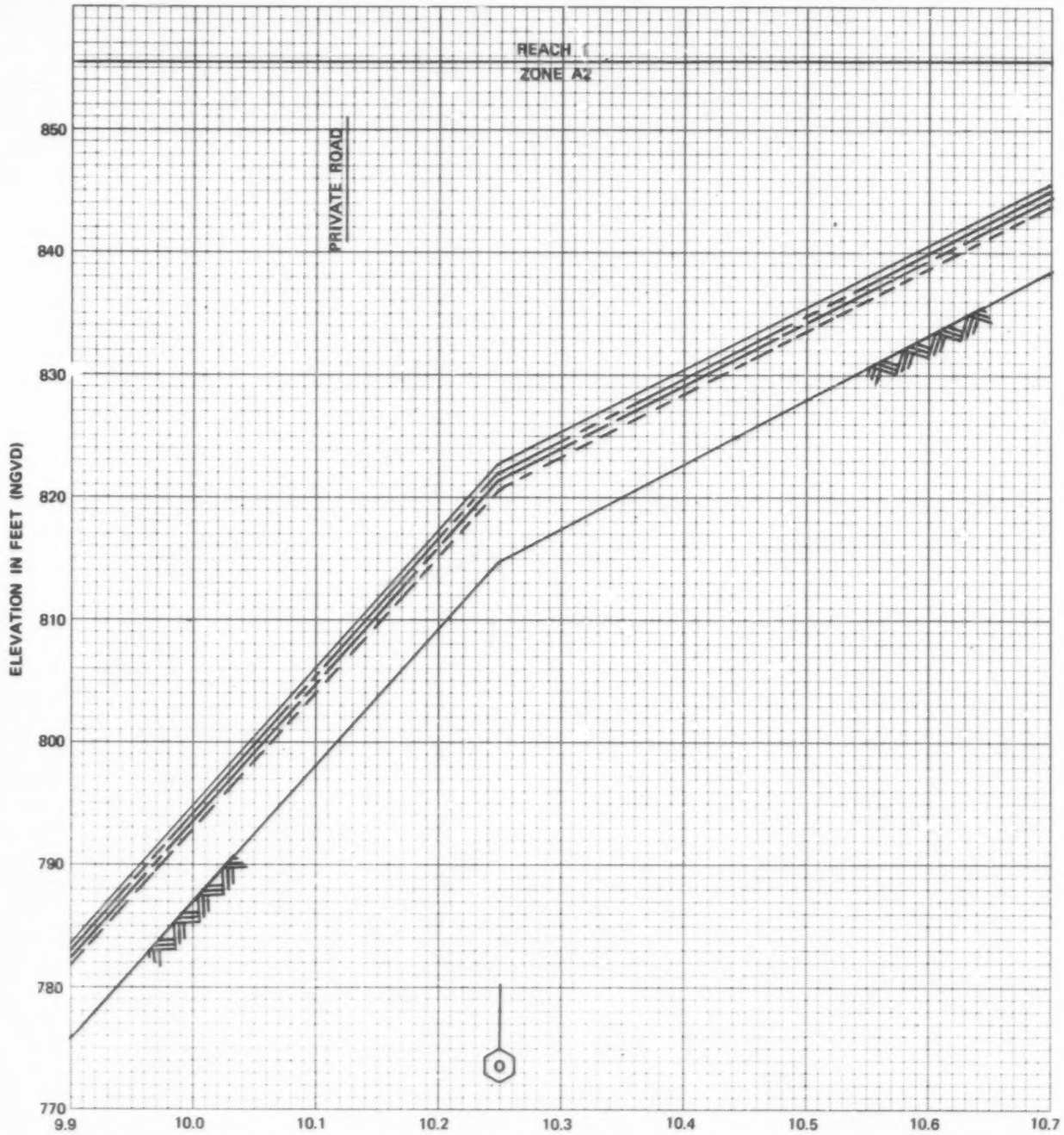
DICKS CREEK

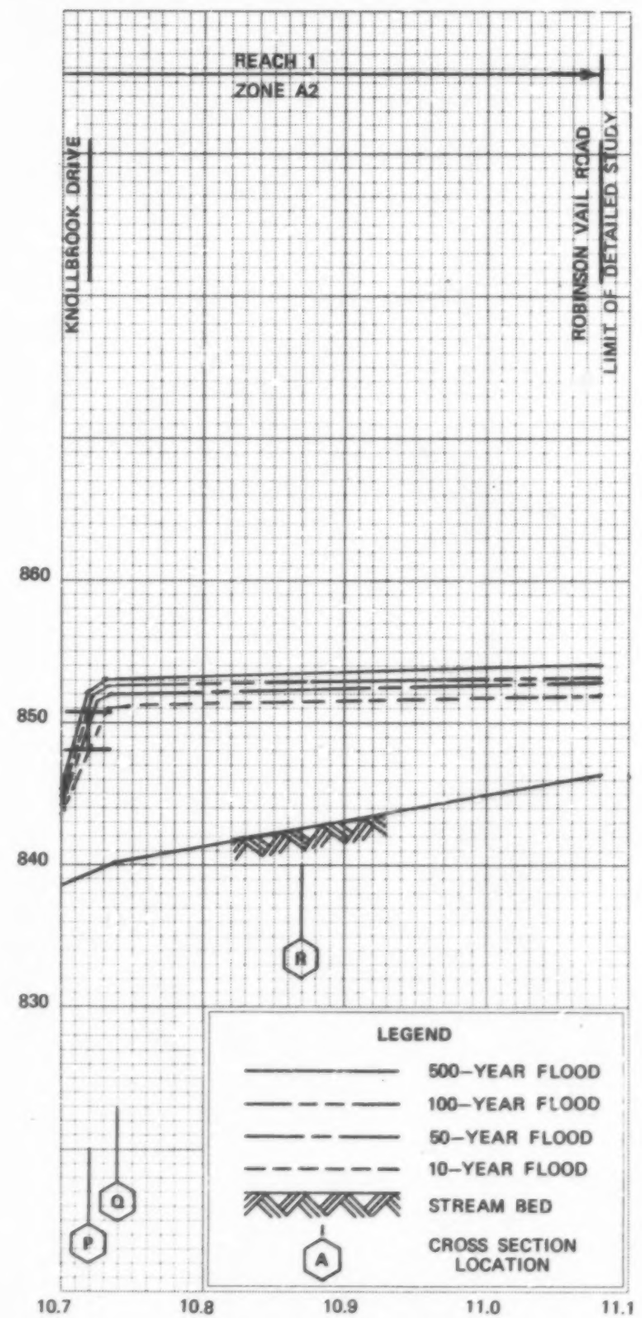
FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

42P

BEST COPY AVAILABLE





STREAM DISTANCE IN MILES ABOVE CONFLUENCE WITH GREAT MIAMI RIVER

FLOOD PROFILES

DICKS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

43P

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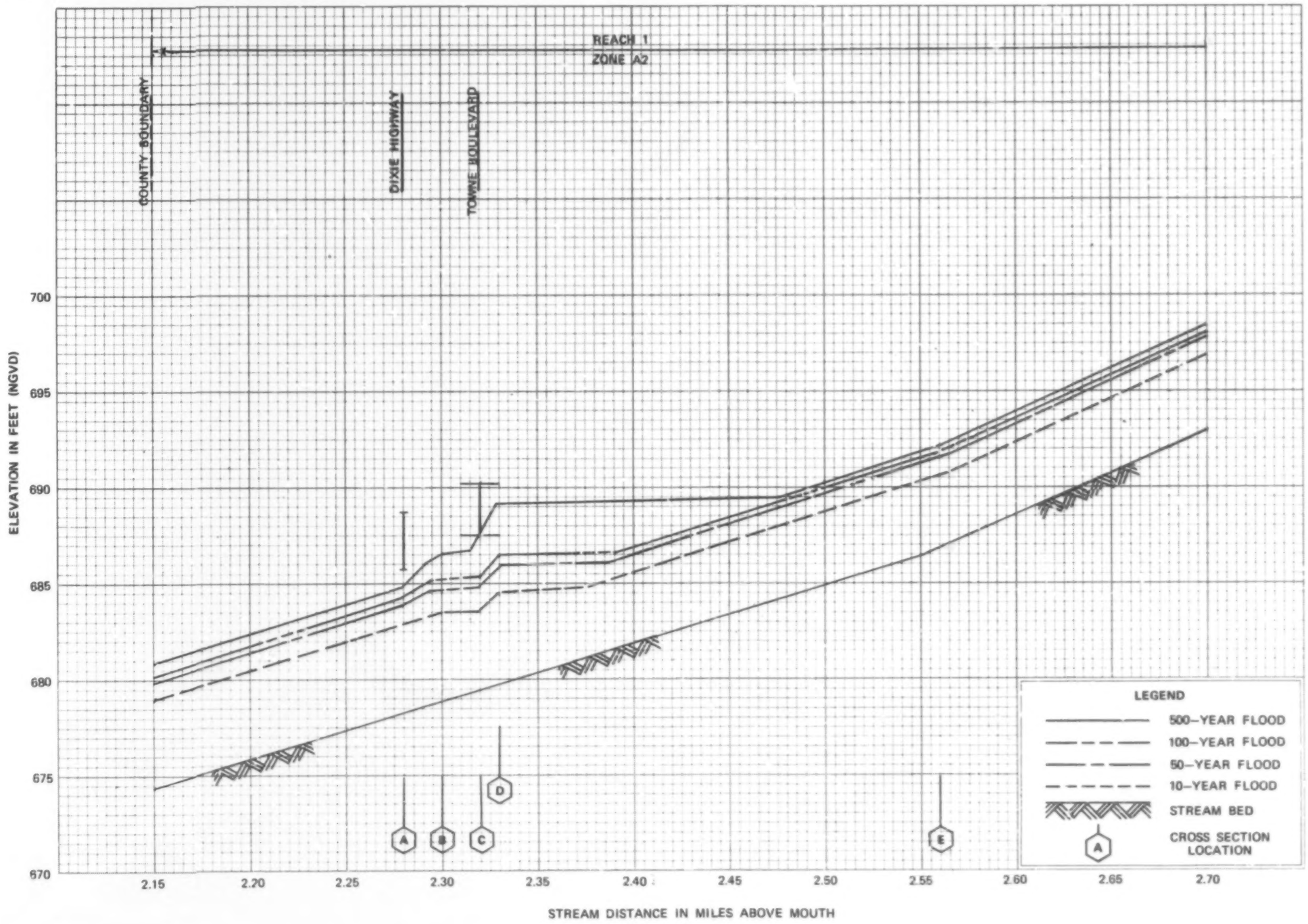

FLOOD PROFILES

NORTH BRANCH DICKS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

44P

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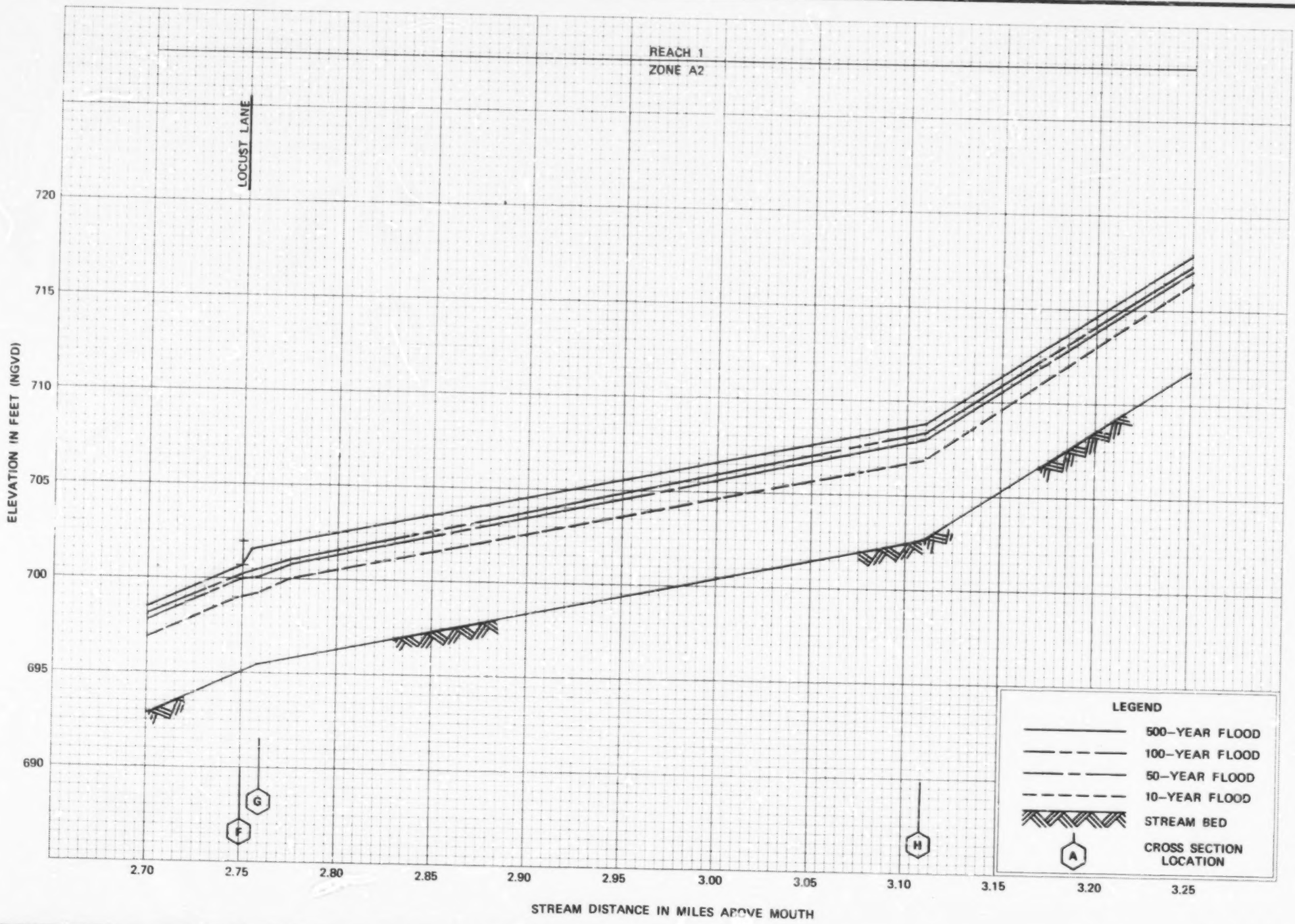

FLOOD PROFILES

NORTH BRANCH DICKS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

45P

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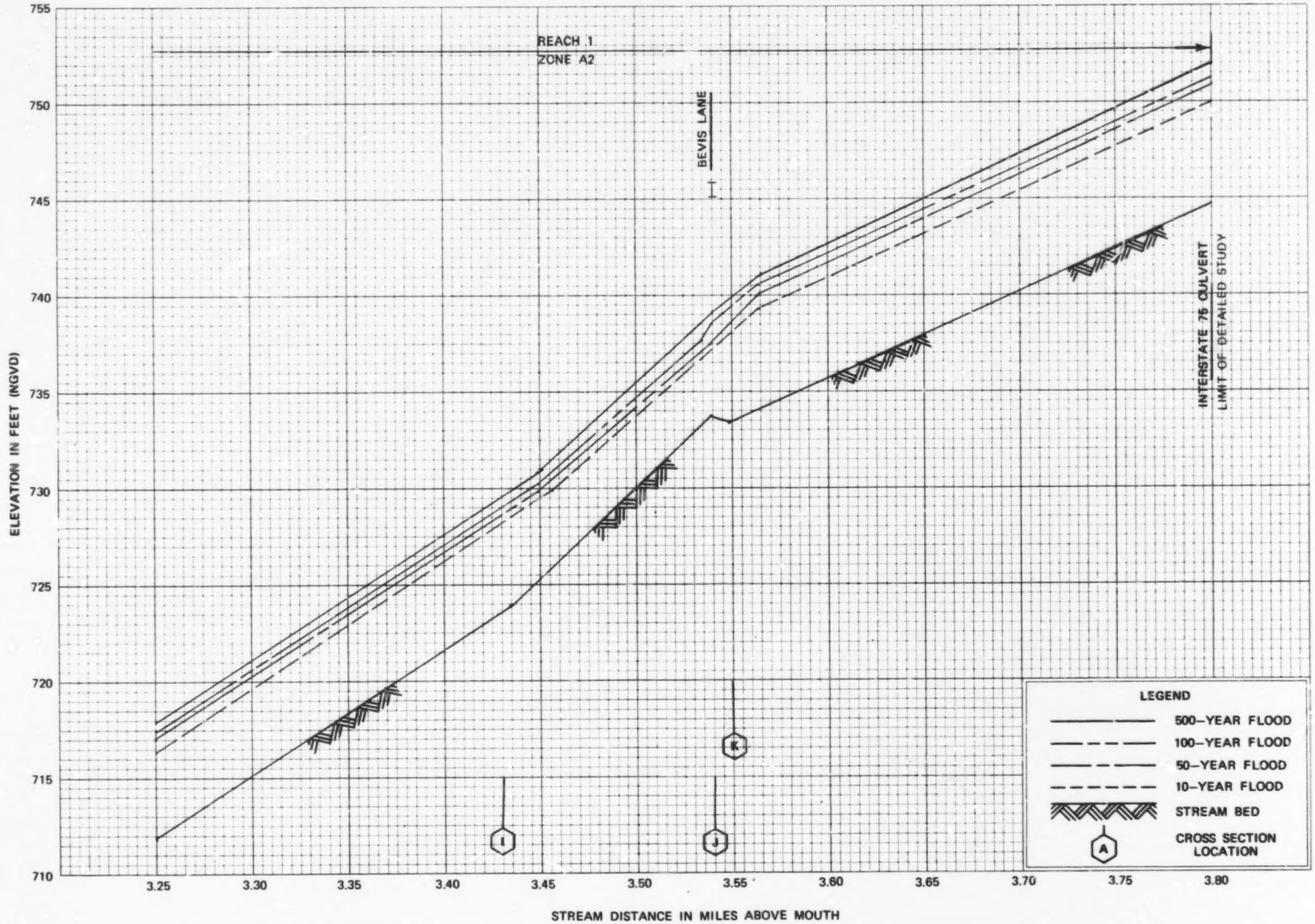

FLOOD PROFILES

NORTH BRANCH DICKS CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

46P

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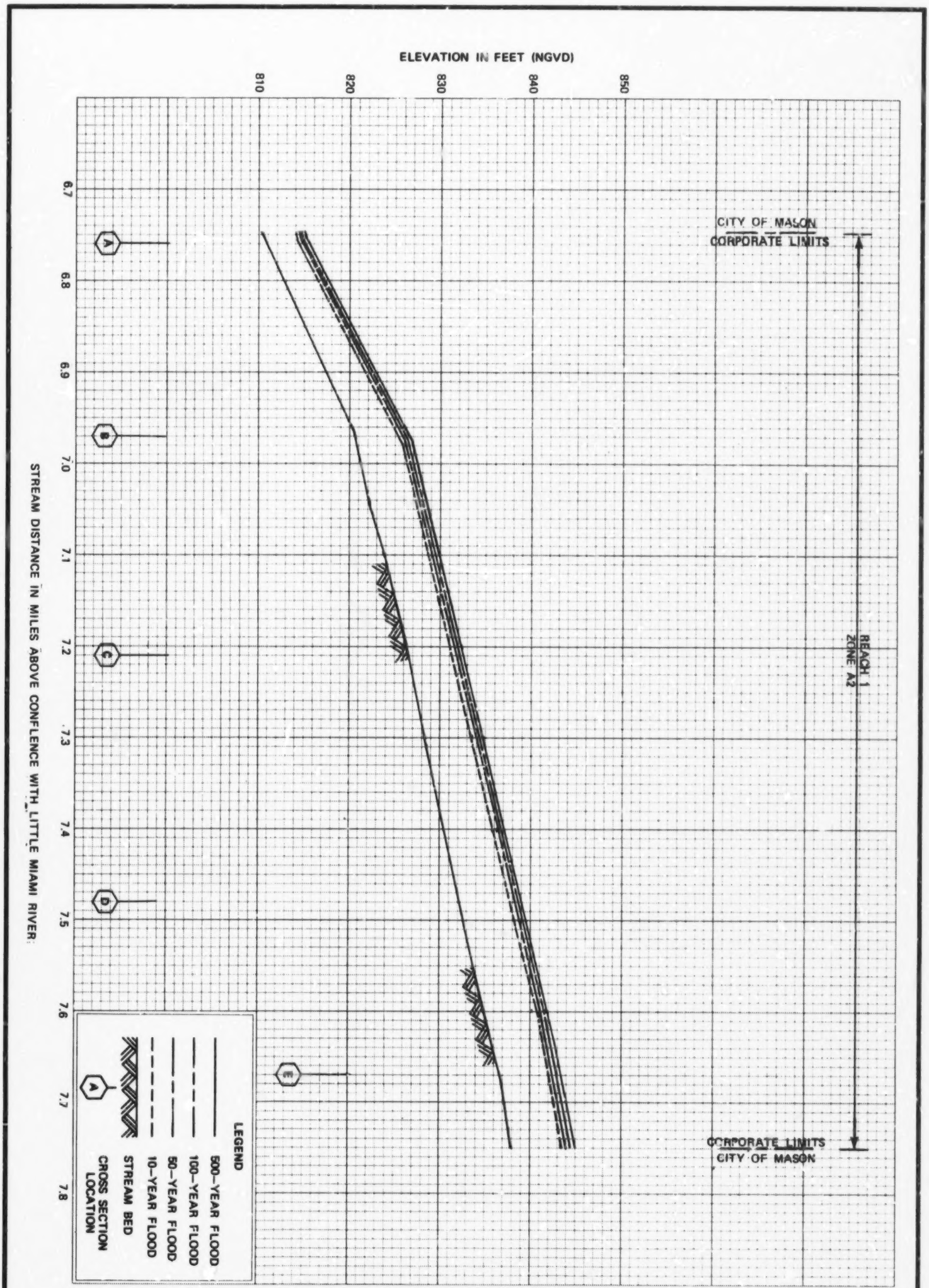

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

FLOOD PROFILES

MUDDY CREEK

47P

RS

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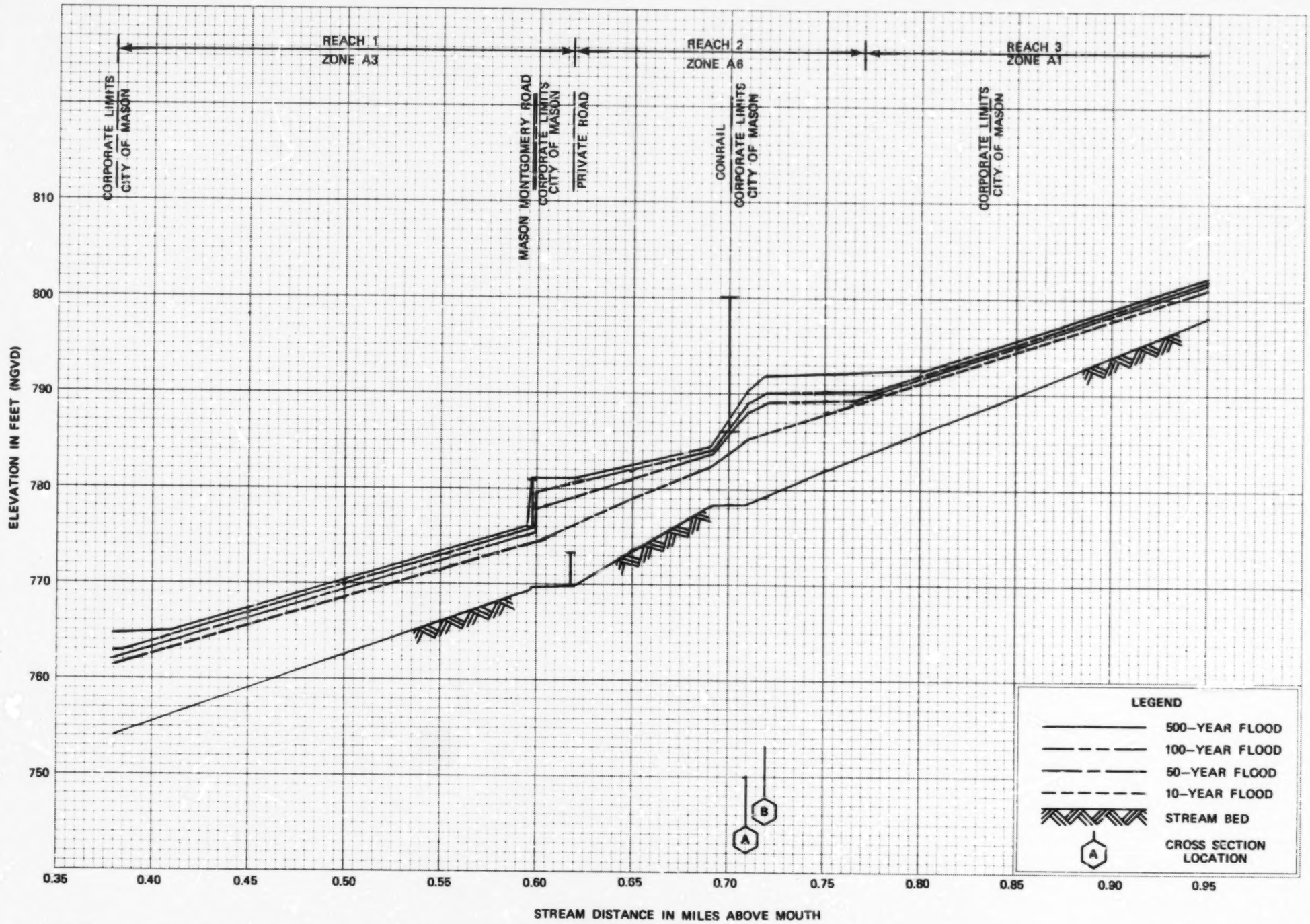

FLOOD PROFILES

MUDDY CREEK BRANCH NO.1

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH

(UNINCORPORATED AREAS)

48P

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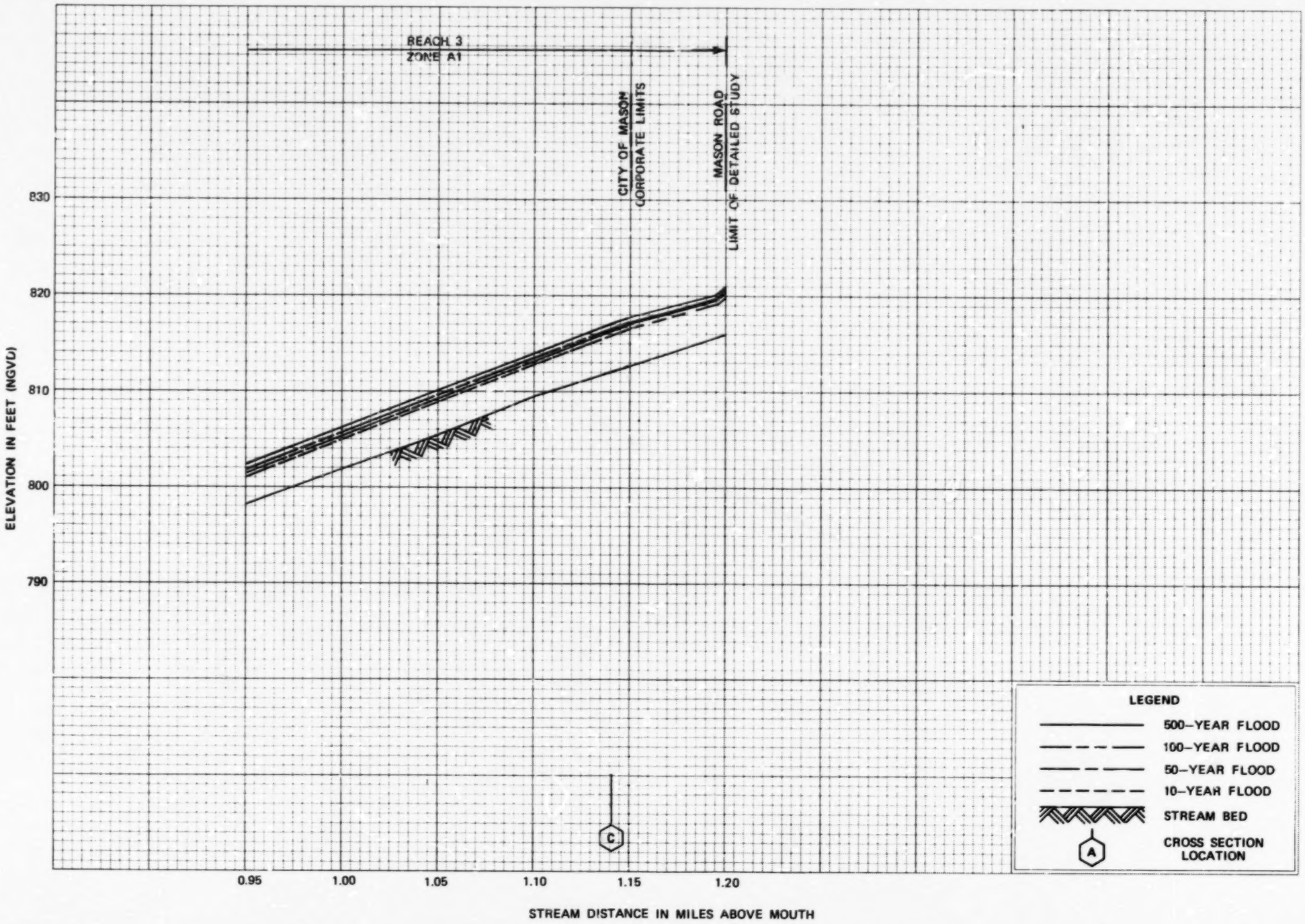

FLOOD PROFILES

MUDDY CREEK BRANCH NO. 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

49P

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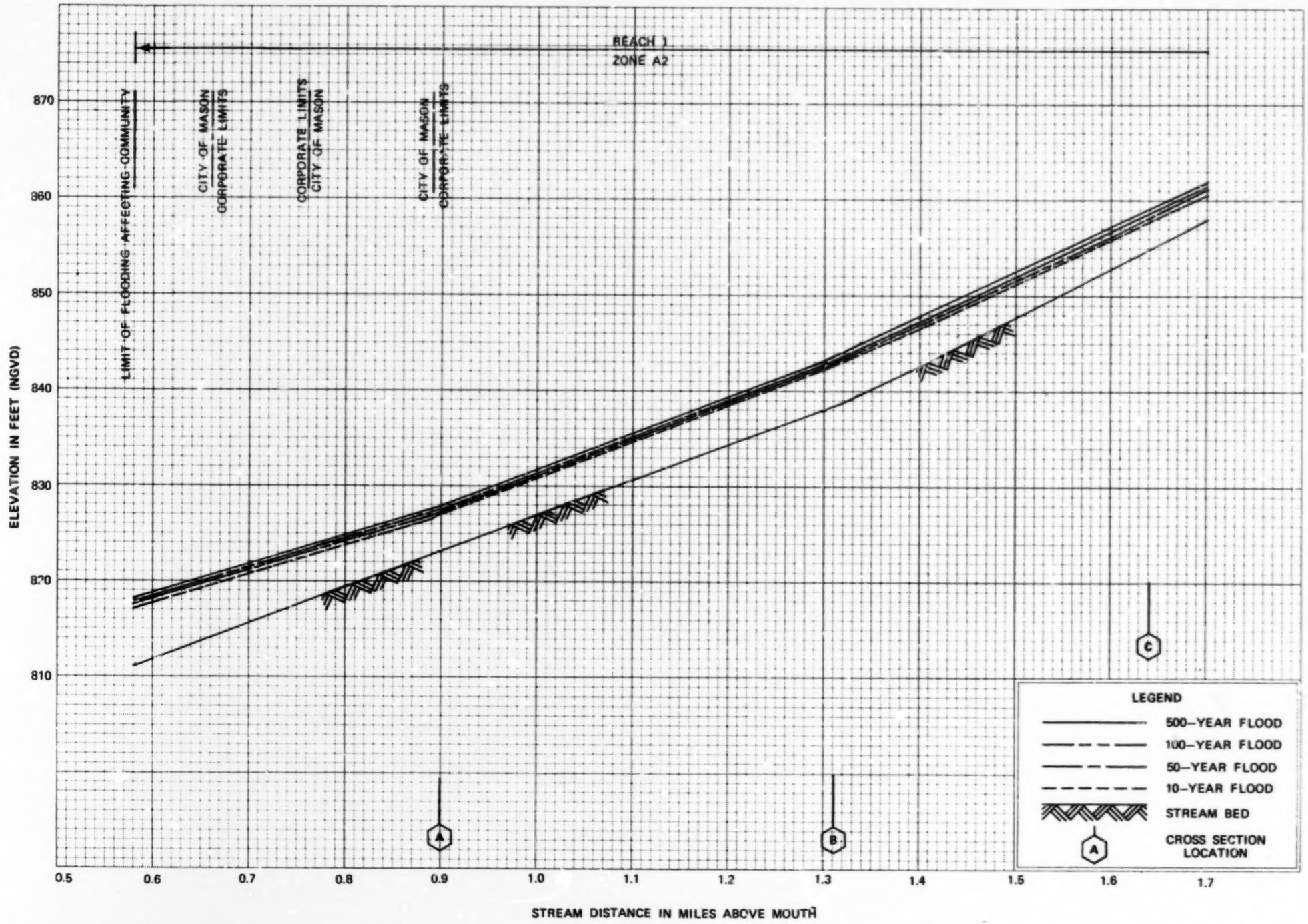

FLOOD PROFILES

MUDDY CREEK BRANCH NO. 2

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

50P

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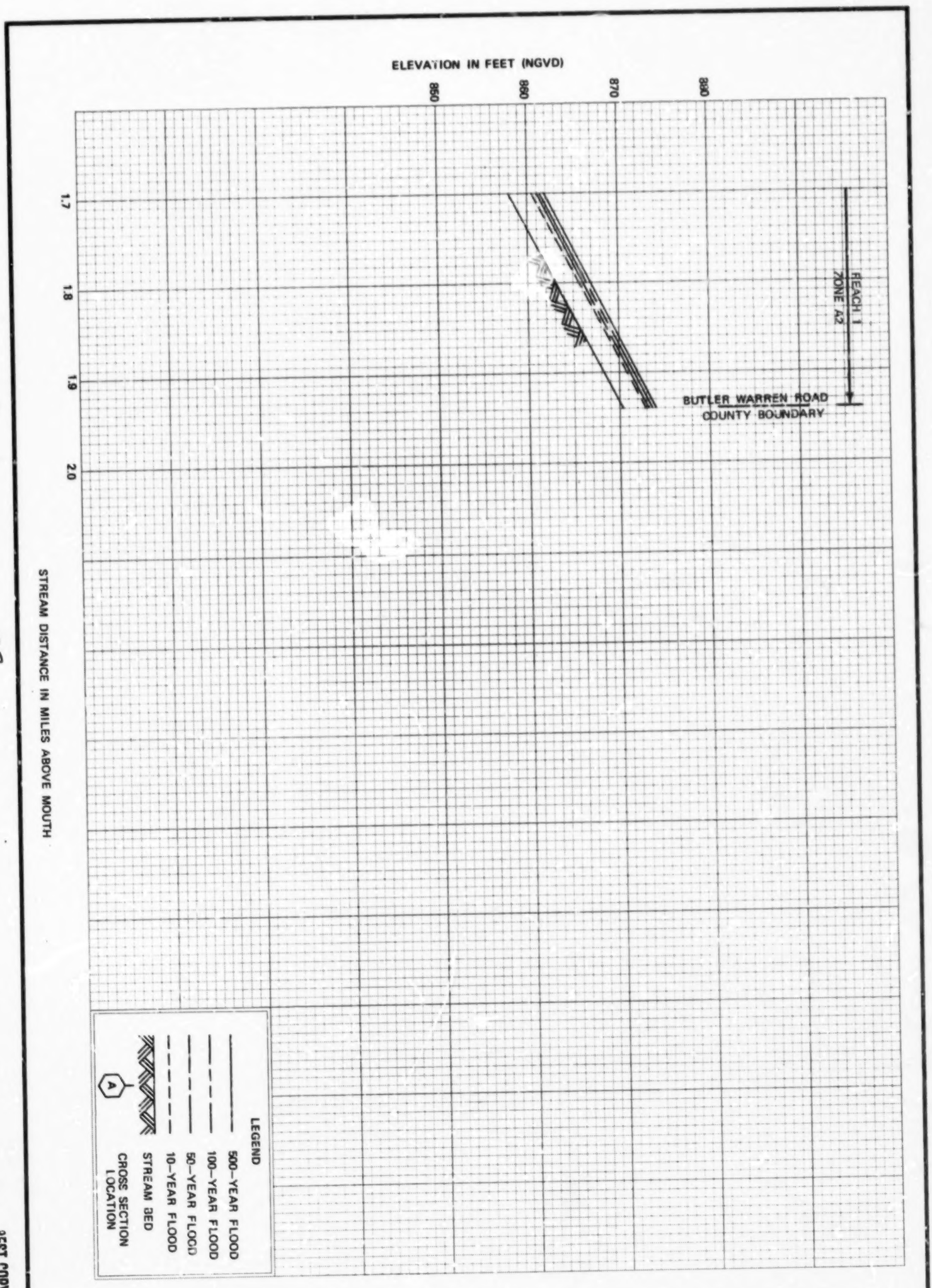
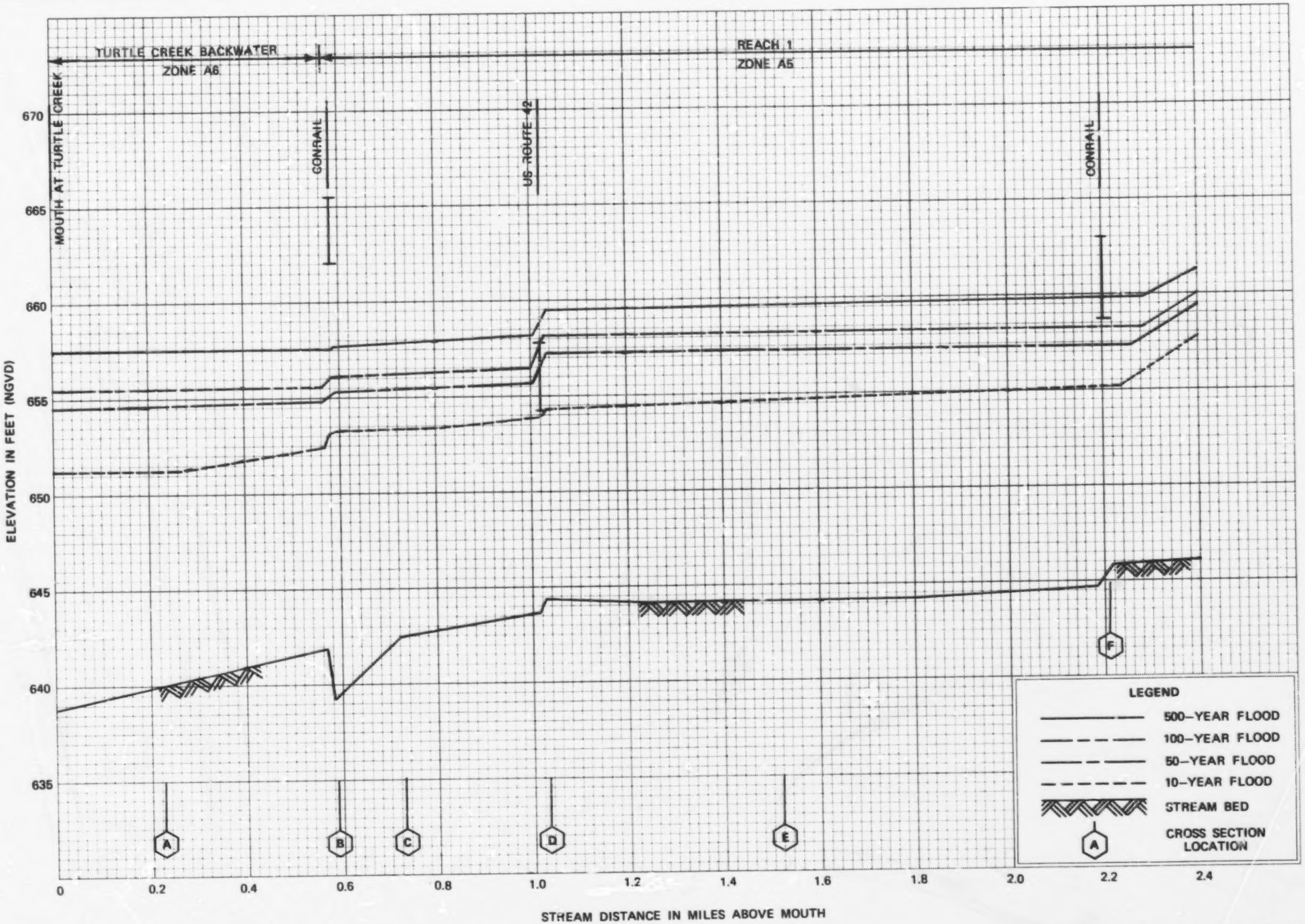


51P	FEDERAL EMERGENCY MANAGEMENT AGENCY COUNTY OF WARREN, OH (UNINCORPORATED AREAS)	FLOOD PROFILES MUDDY CREEK BRANCH NO. 2

BEST COPY AVAILABLE



FLOOD PROFILES

LITTLE MUDDY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

52P

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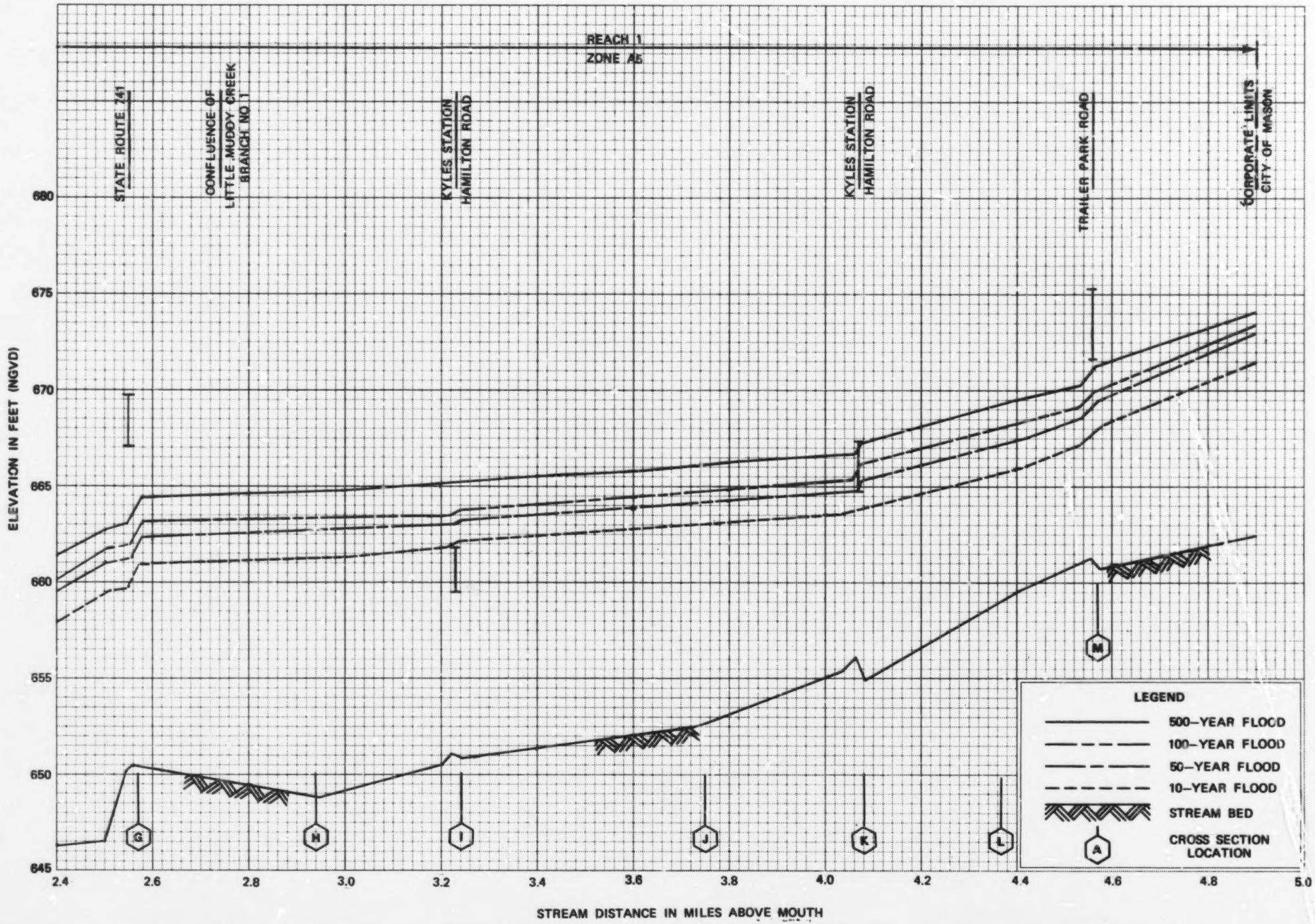


FLOOD PROFILES

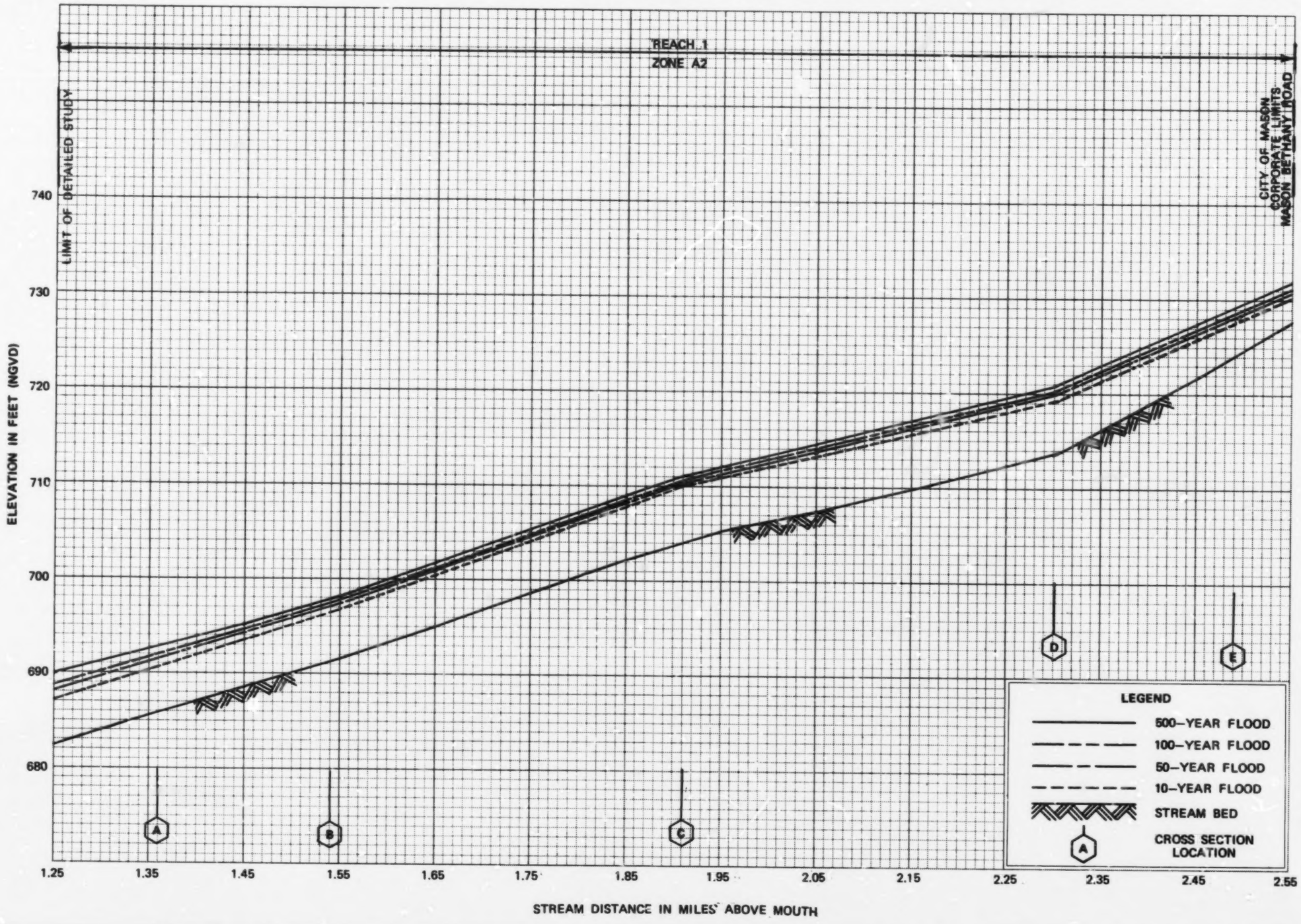
LITTLE MUDDY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

53P

BEST COPY AVAILABLE



FLOOD PROFILES

LITTLE MUDDY CREEK BRANCH NO. 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

54P

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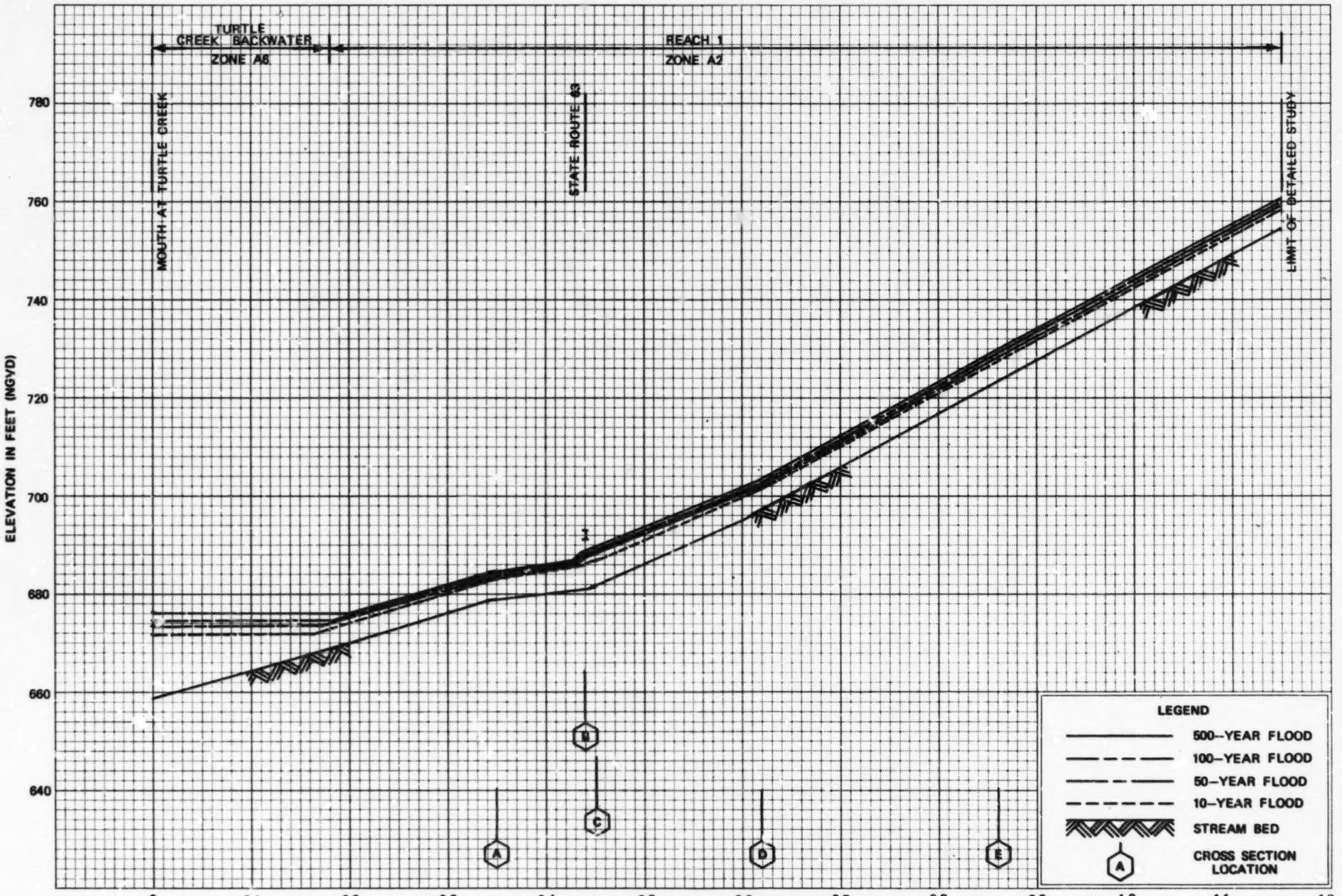

FLOOD PROFILES

MULFORDS RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

55P

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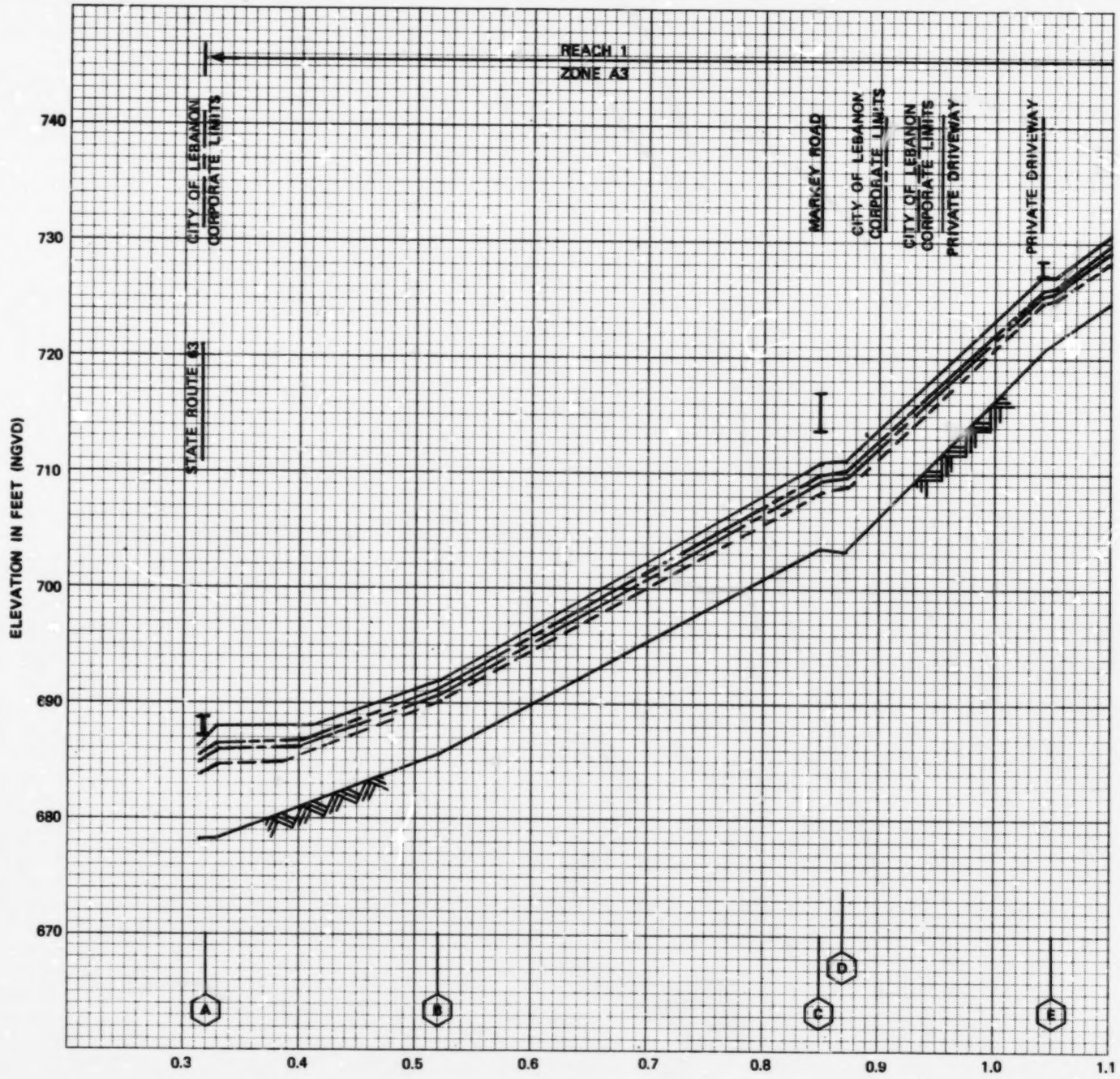

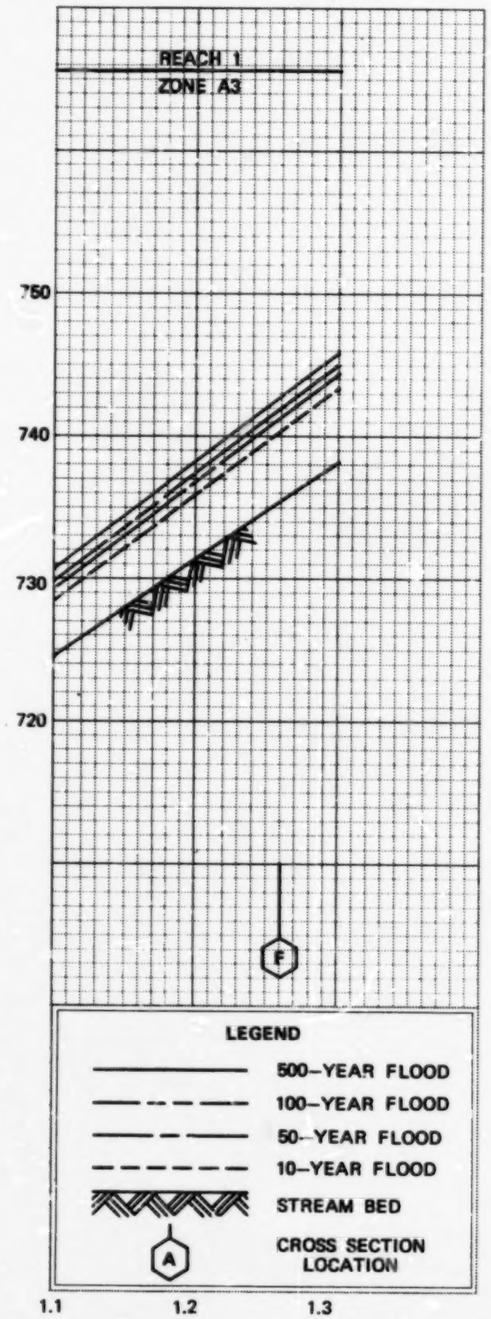

FLOOD PROFILES

REEDERS RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

56P

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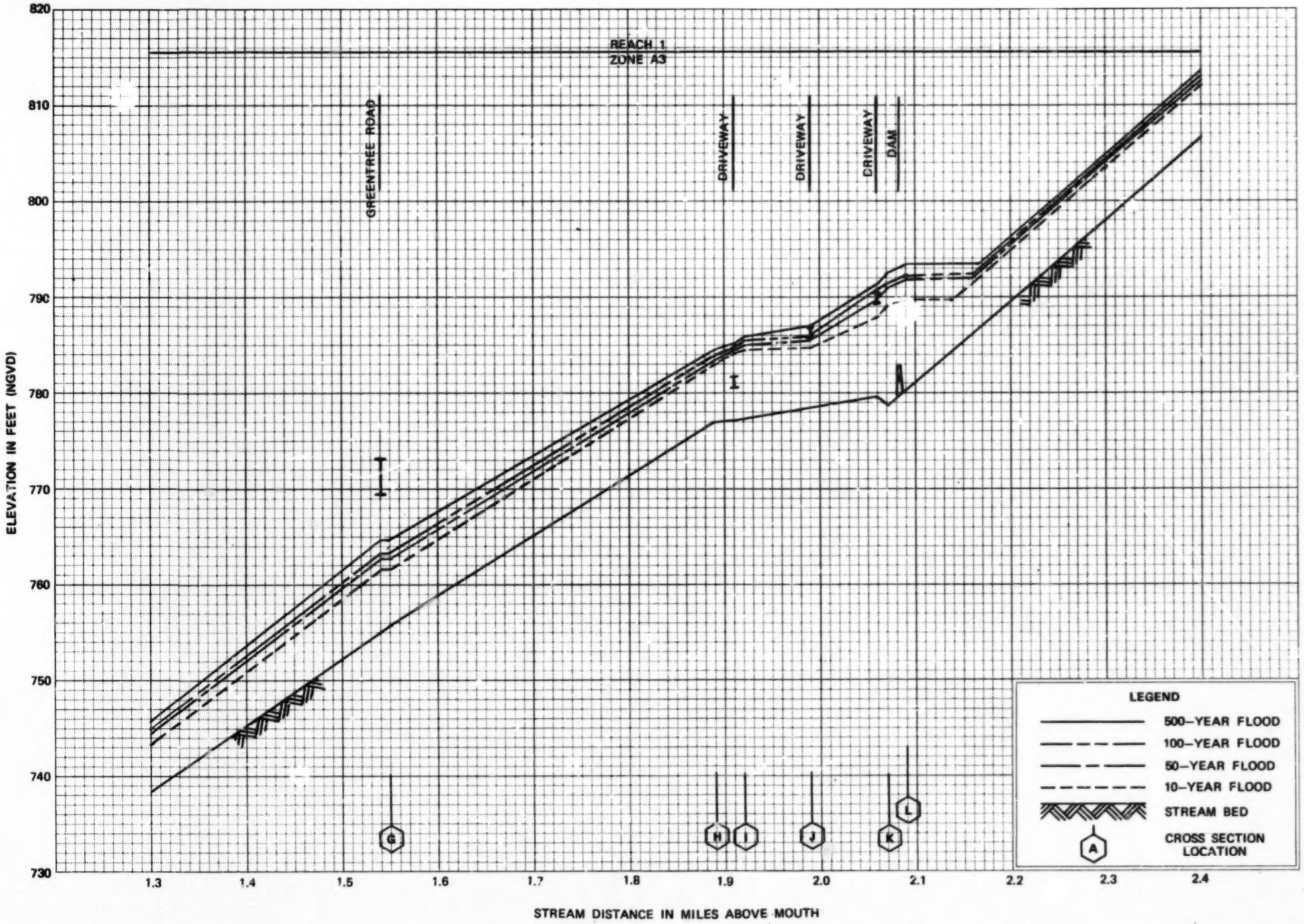


FLOOD PROFILES

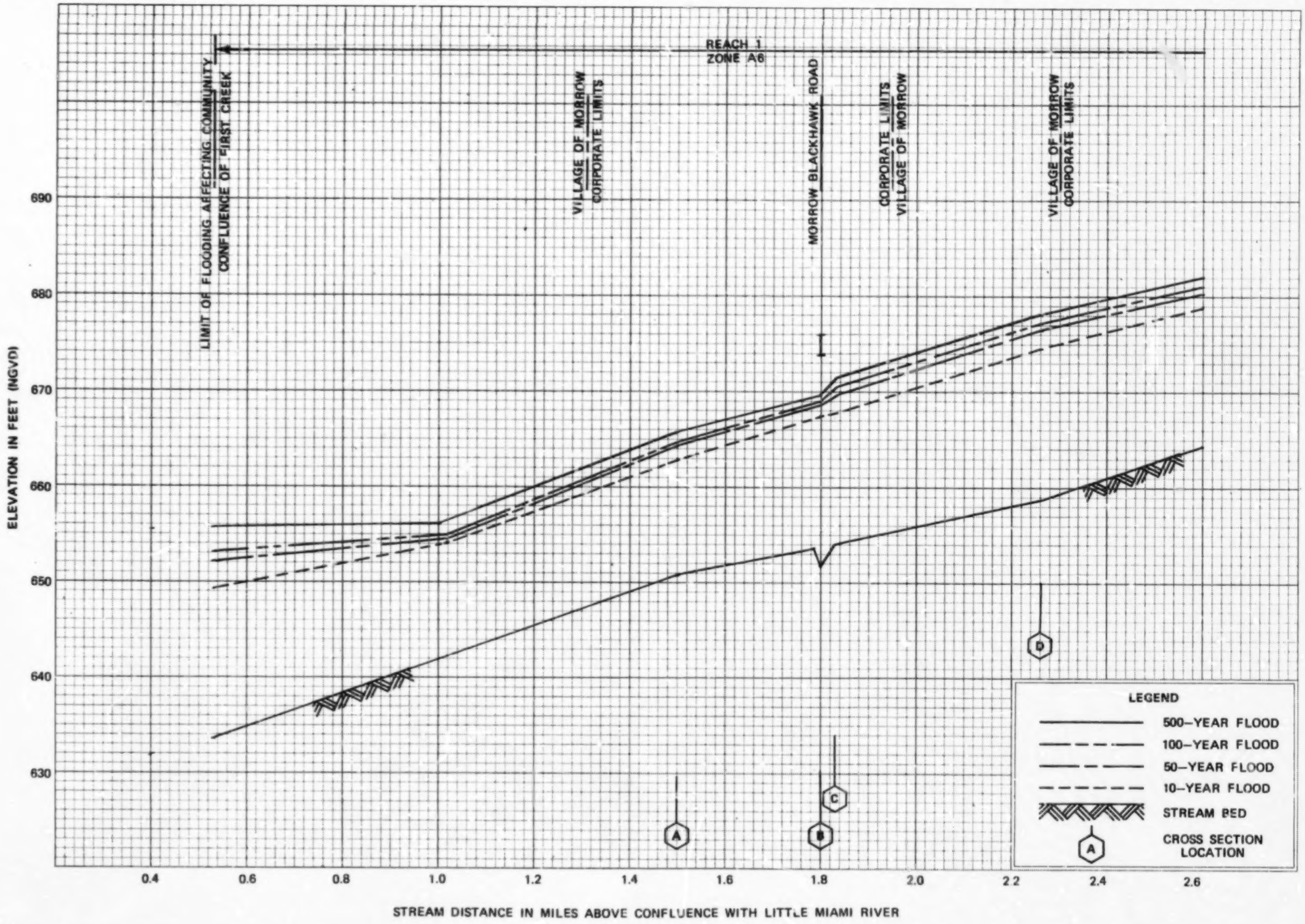
REEDERS RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

57P

BEST COPY AVAILABLE



FLOOD PROFILES

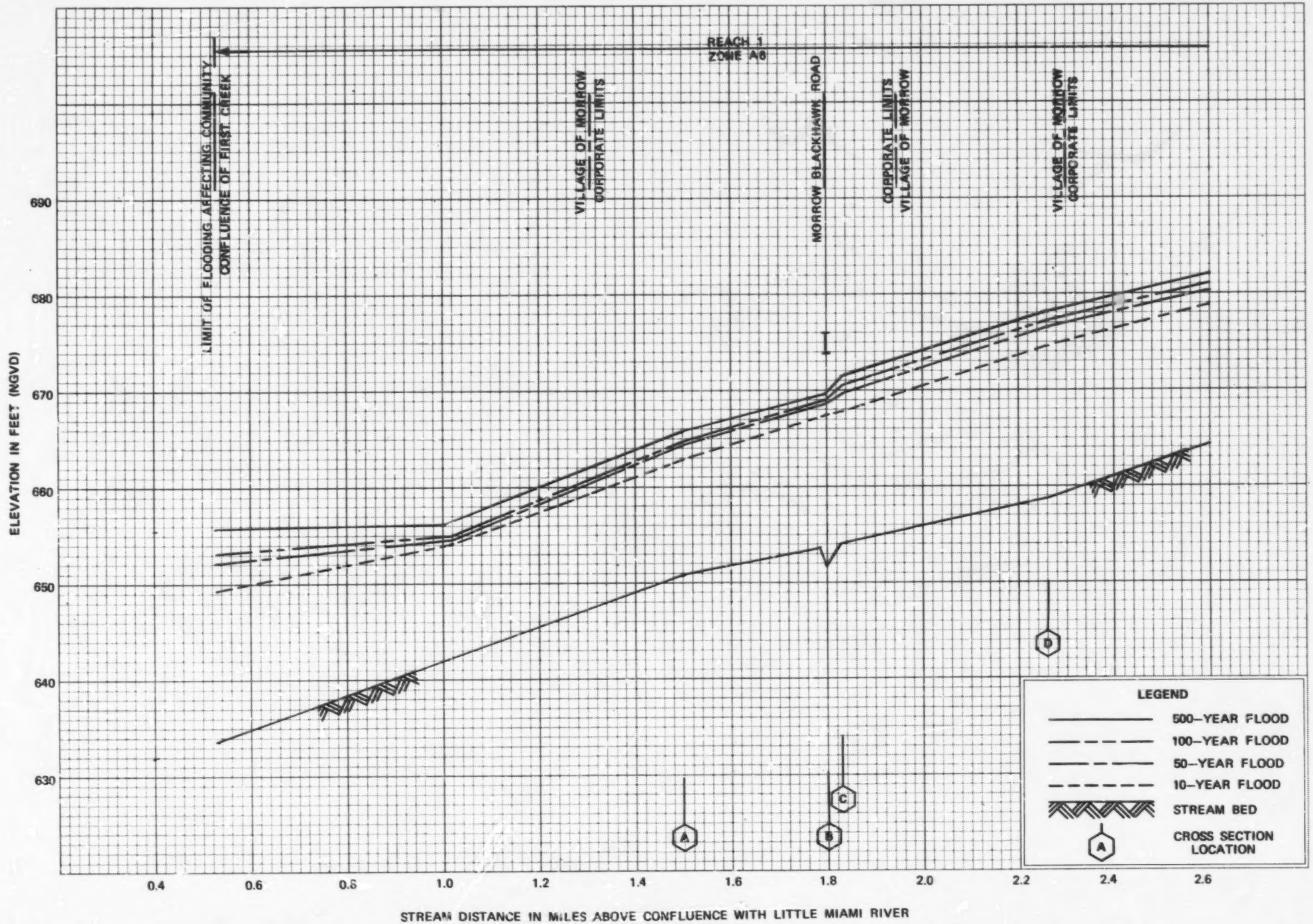
TODD FORK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

59P

BEST COPY AVAILABLE



FLOOD PROFILES

TODD FORK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

59P

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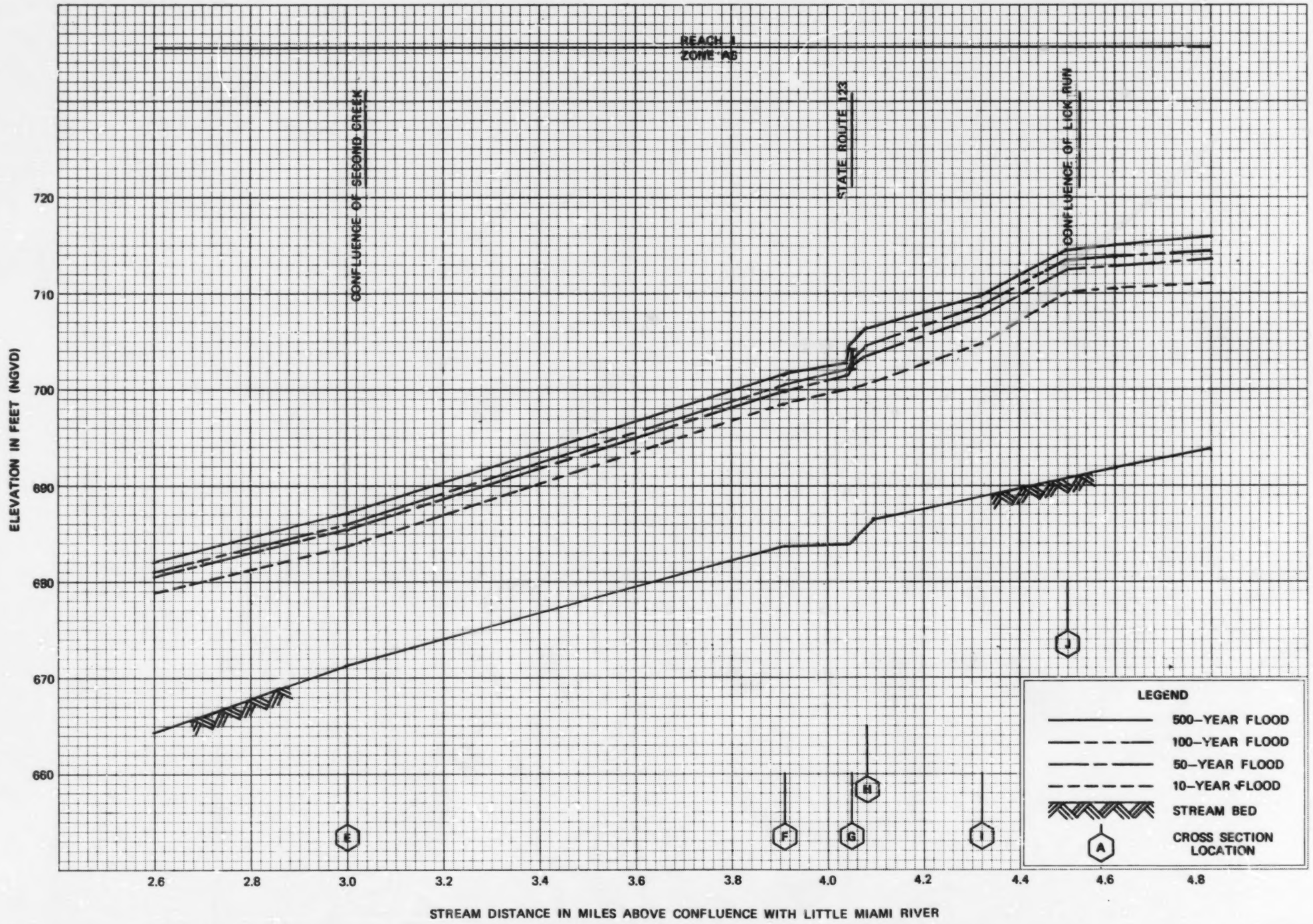

FLOOD PROFILES

TODD FORK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

60P

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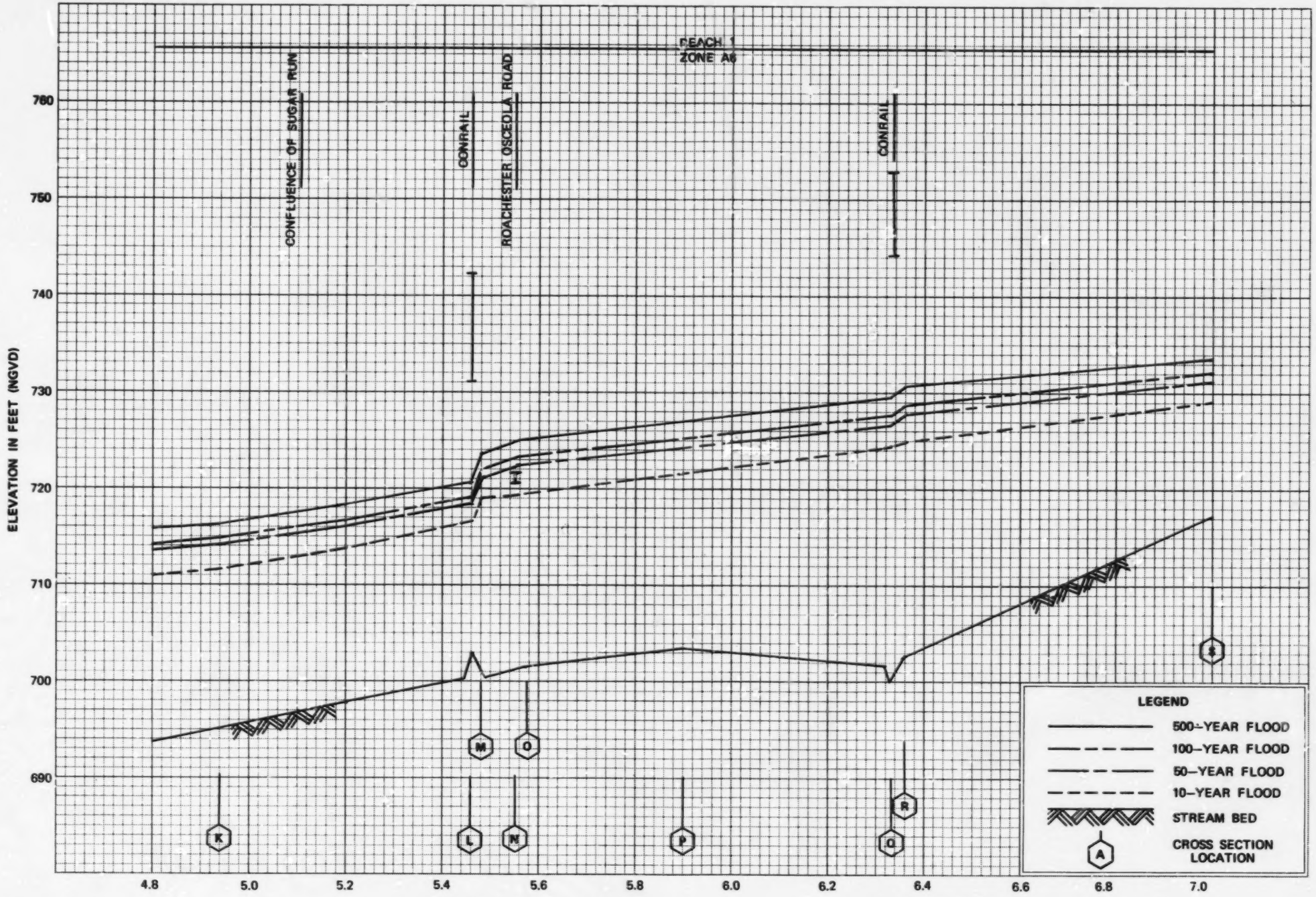

FLOOD PROFILES

TODD FORK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

61P

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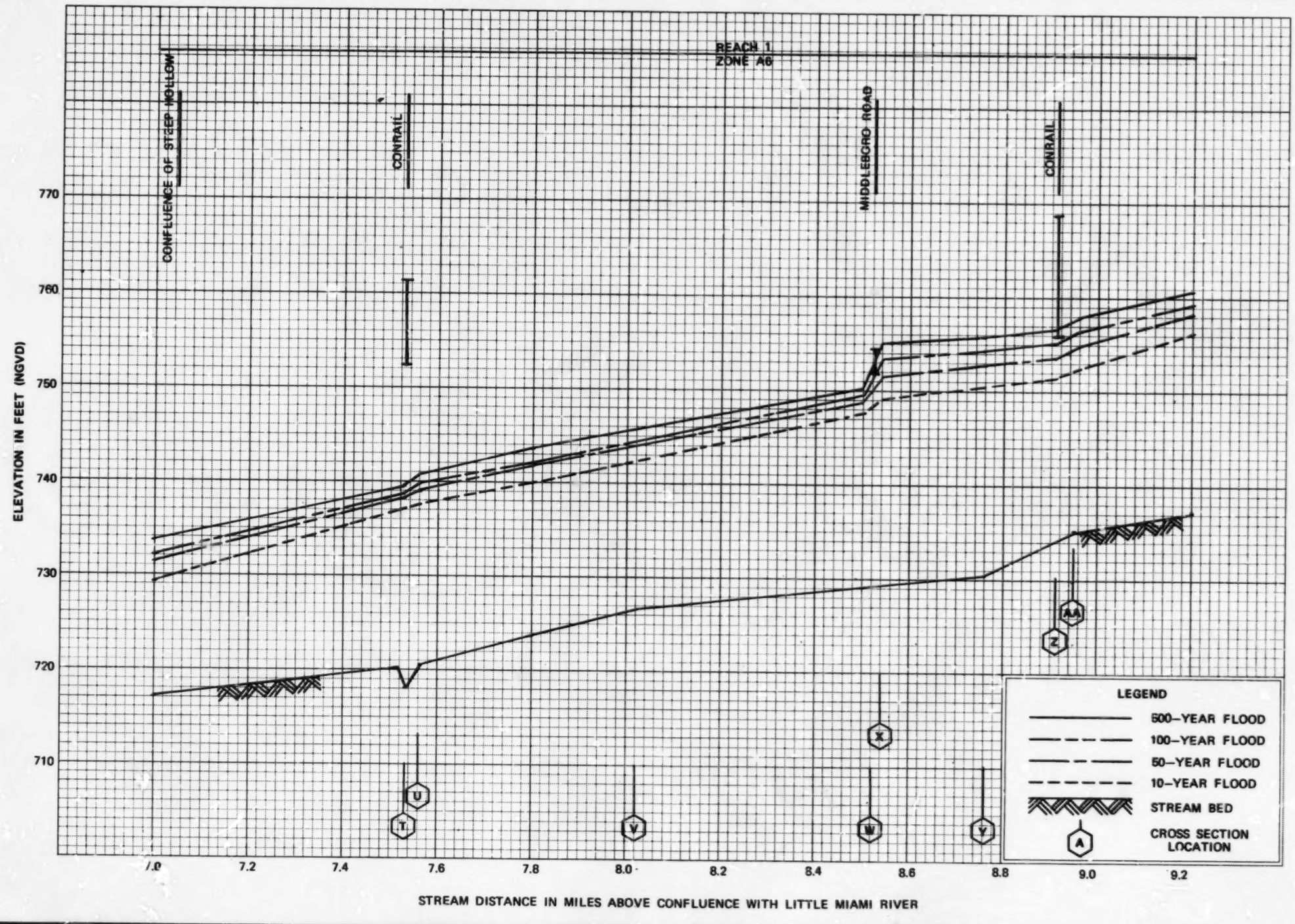

FLOOD PROFILES

TODD FORK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

62P

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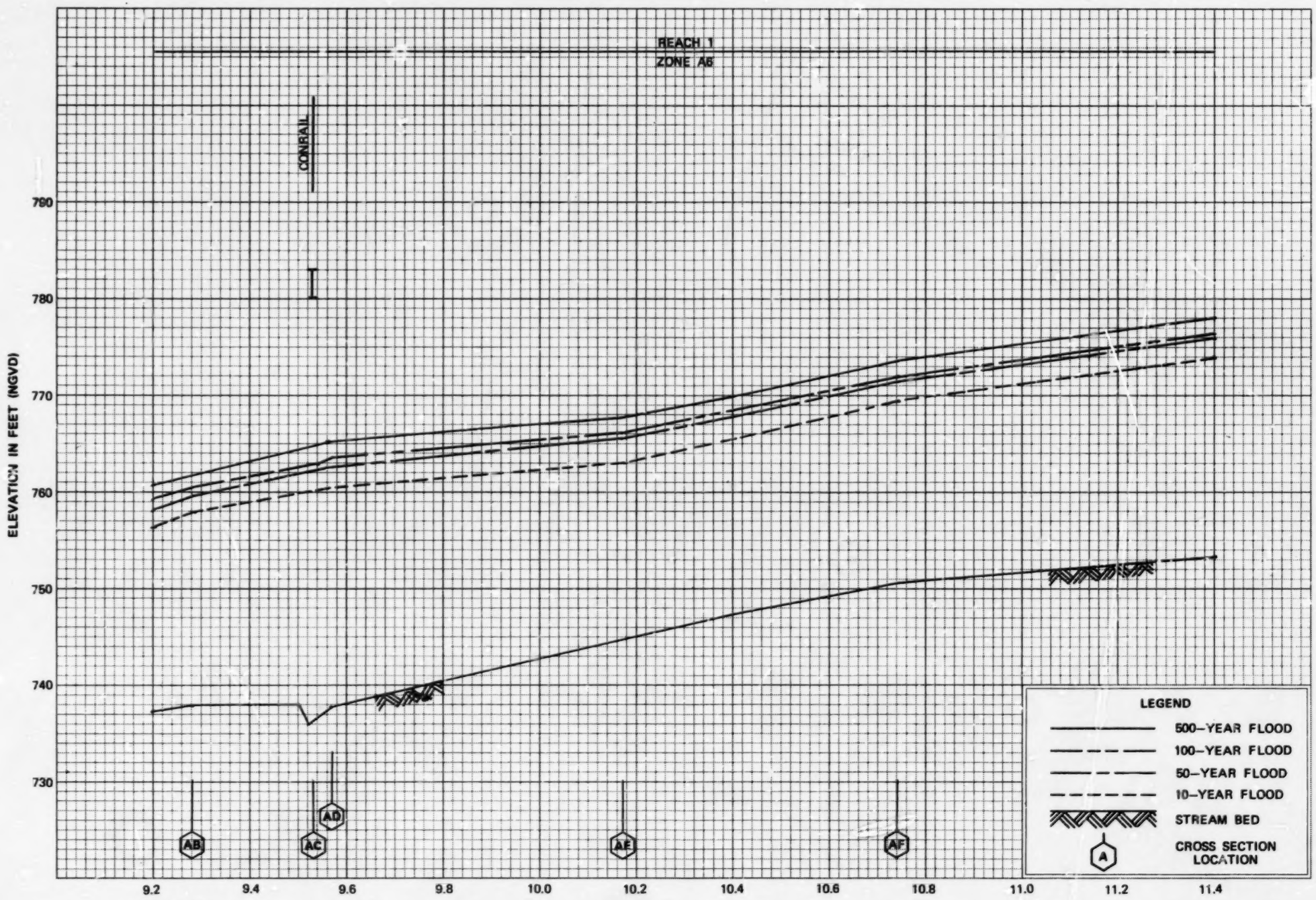

FLOOD PROFILES

TODD FORK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

63P

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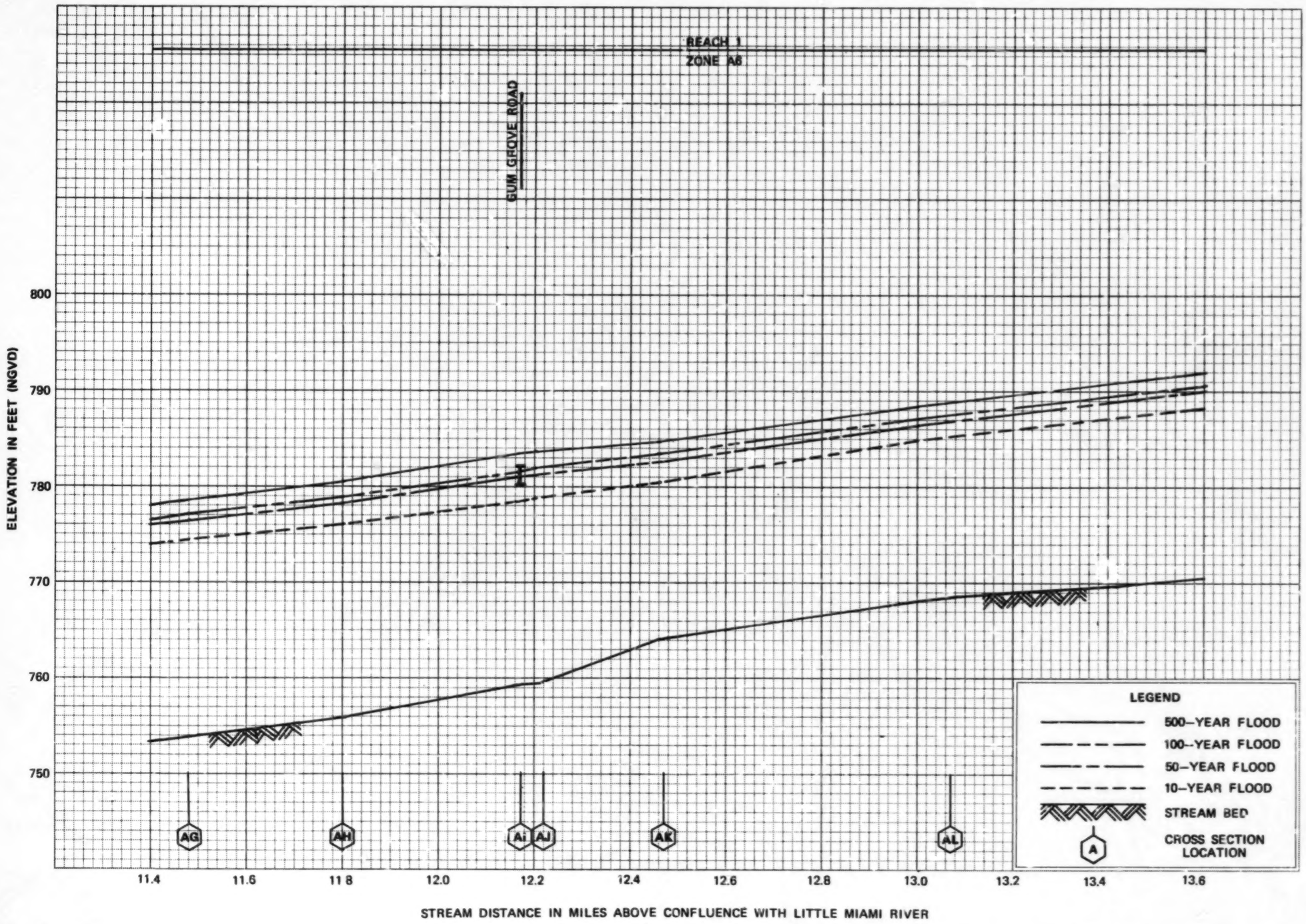

FLOOD PROFILES

TODD FORK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

64P

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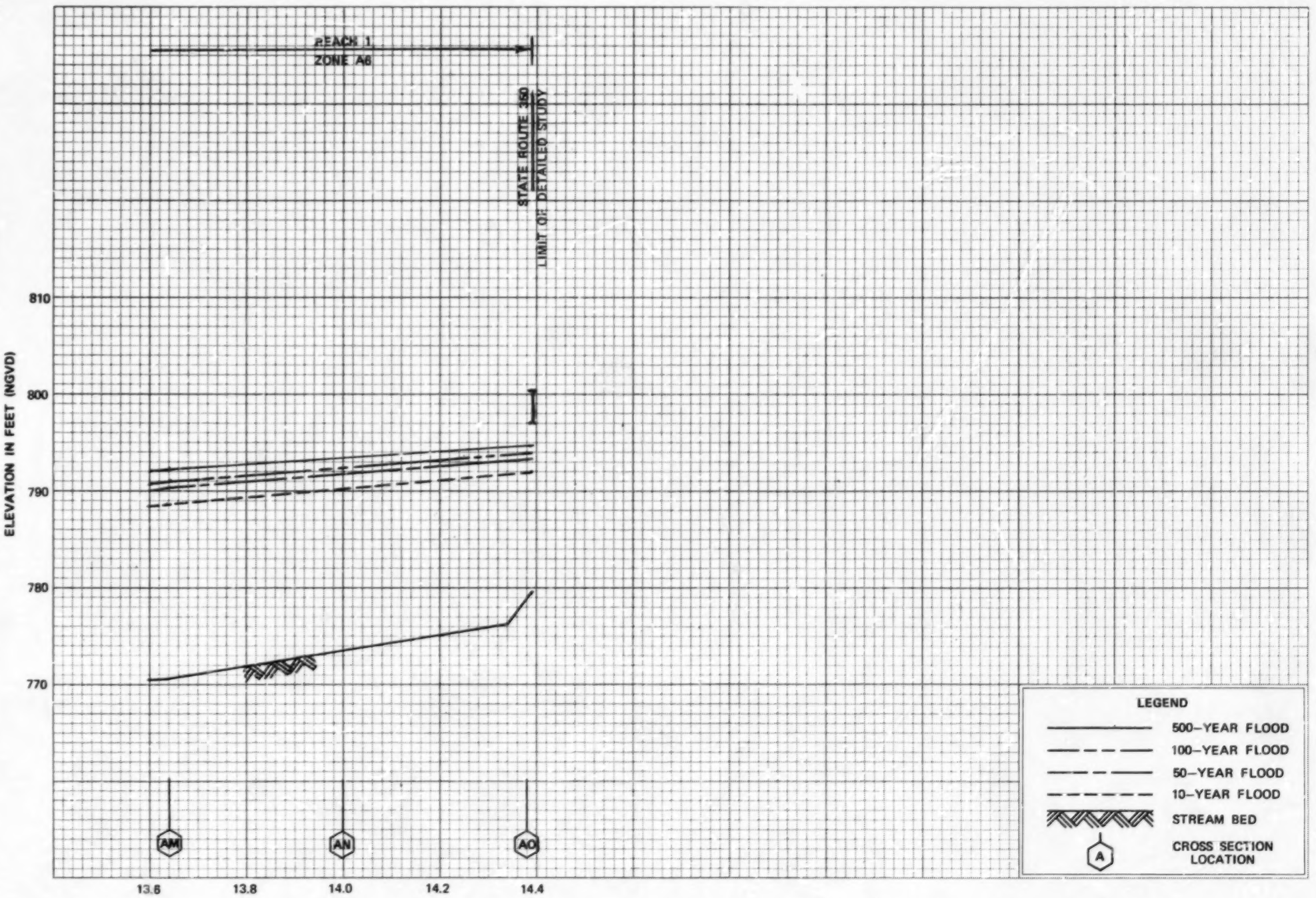

FLOOD PROFILES

TODD FORK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

65P

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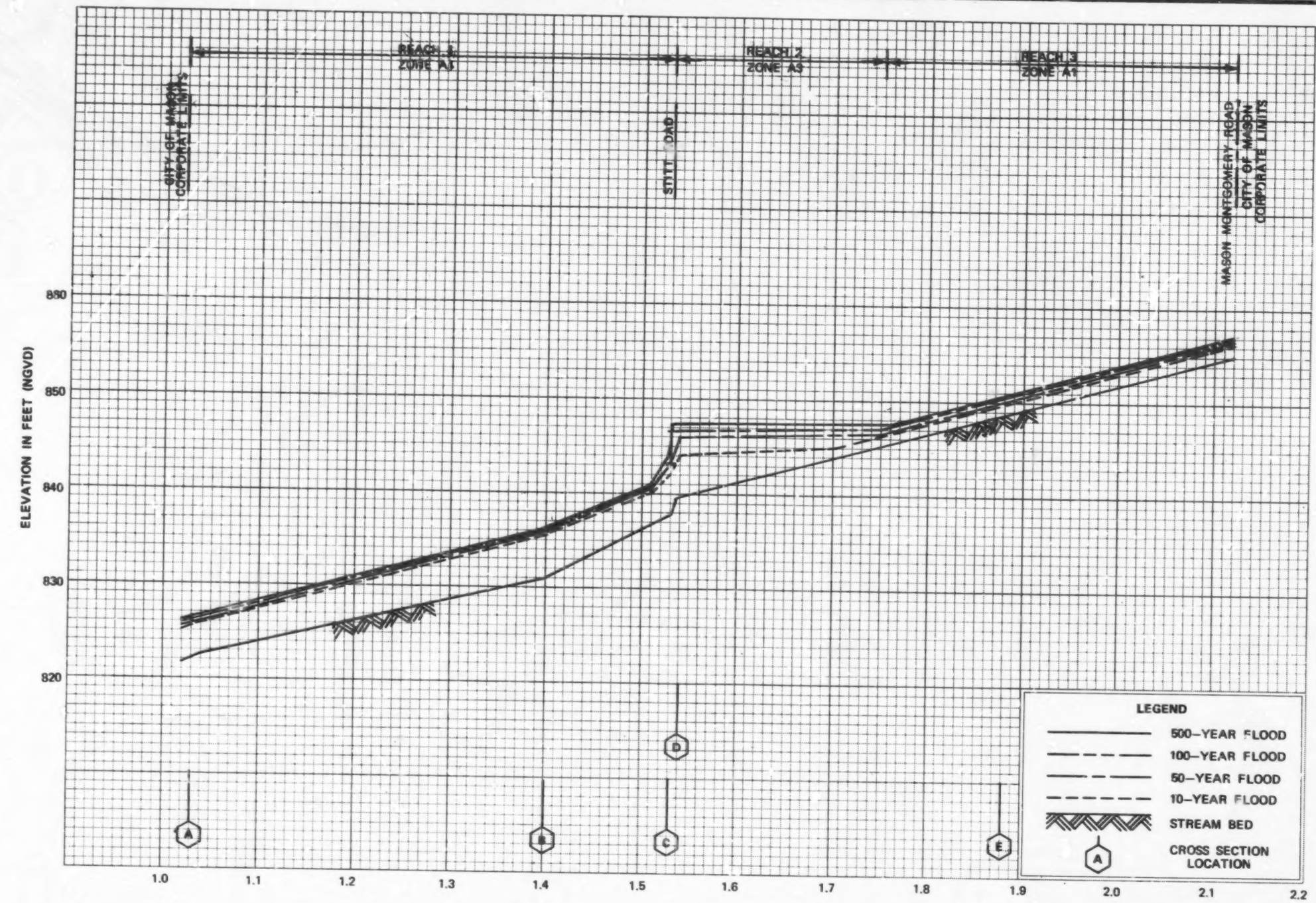

FLOOD PROFILES

PINE RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

66P

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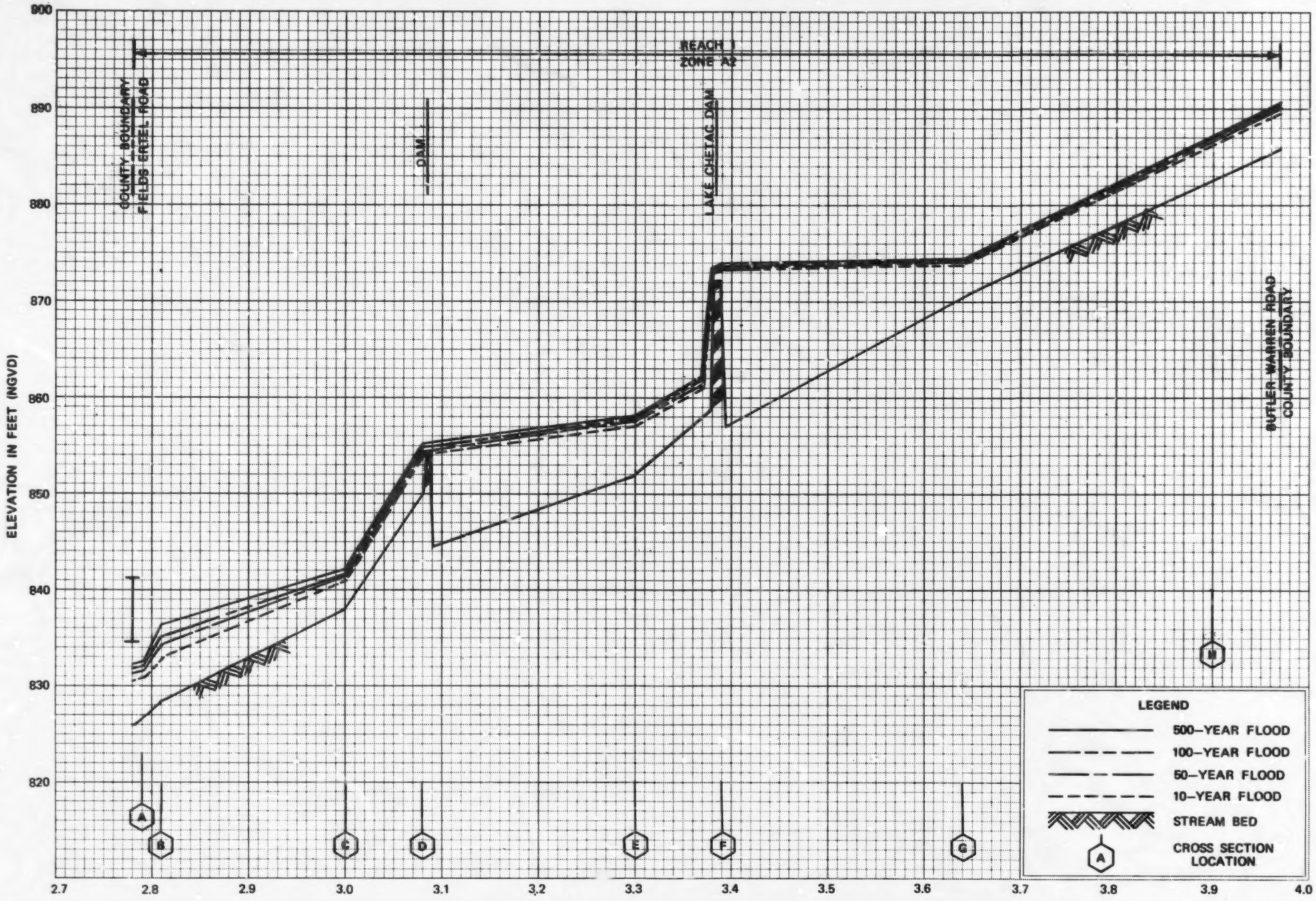

FLOOD PROFILES

LAKE CHETAC CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

67P

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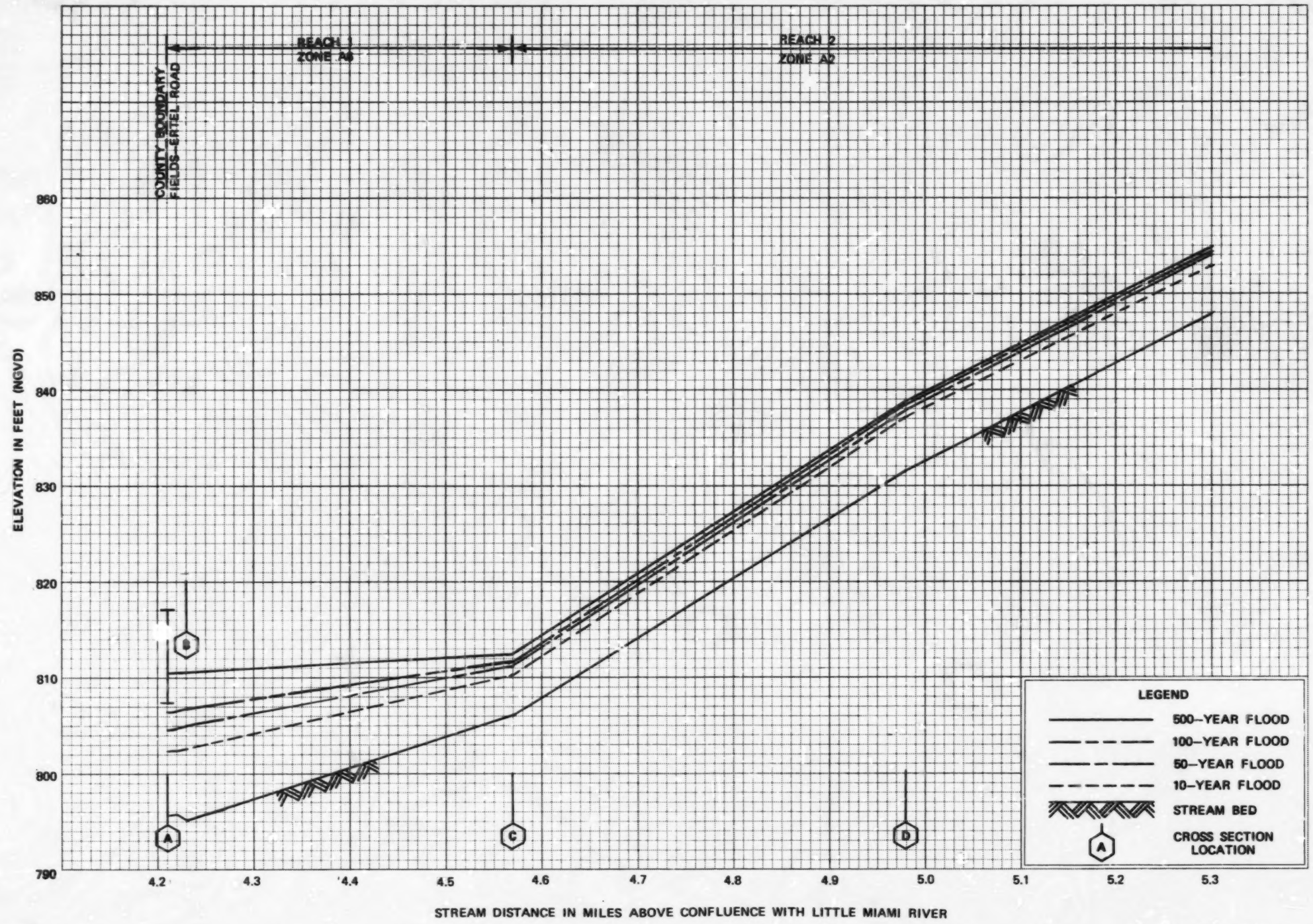

FLOOD PROFILES

POLK RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

68P

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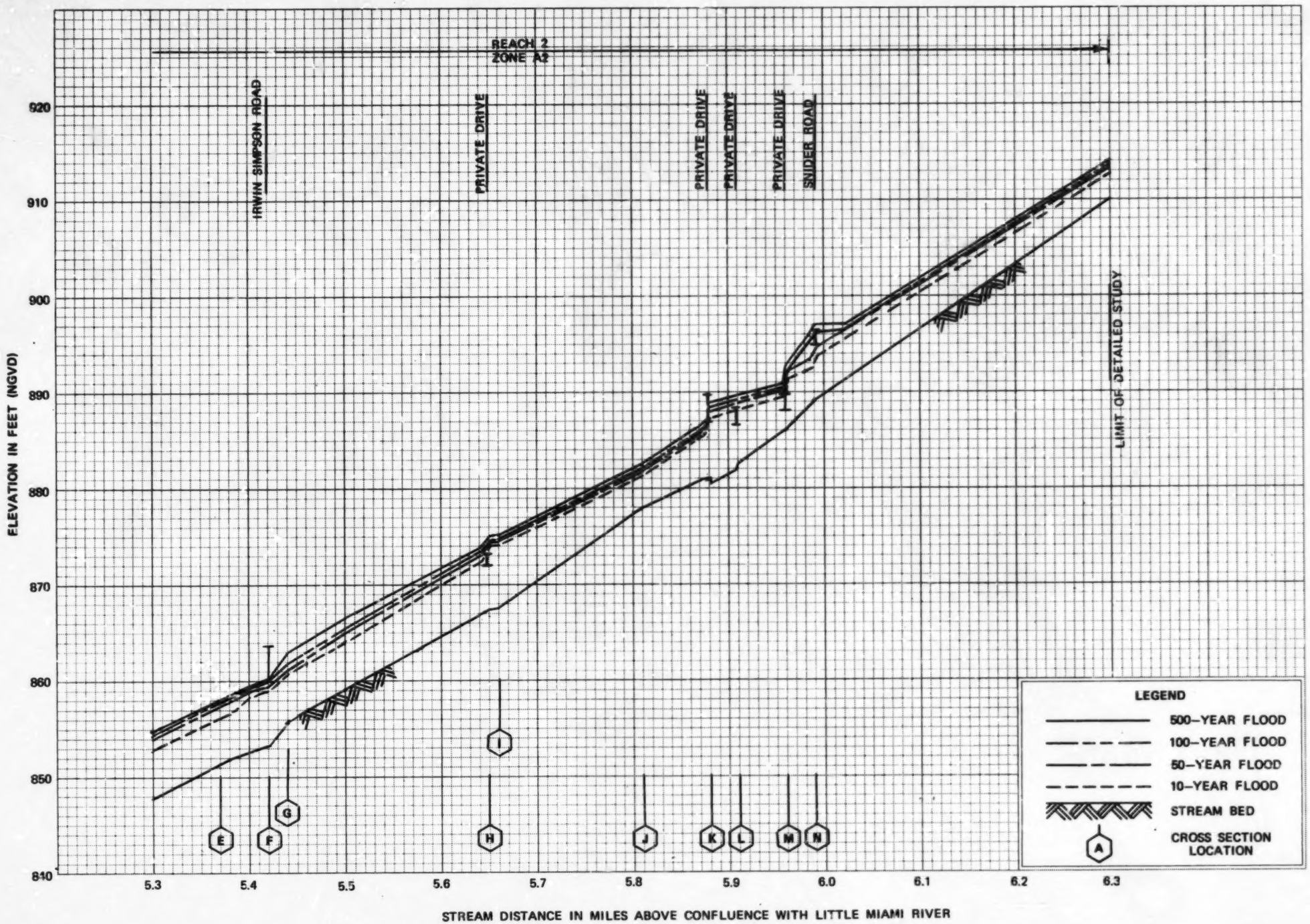

FLOOD PROFILES

POLK RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

69P

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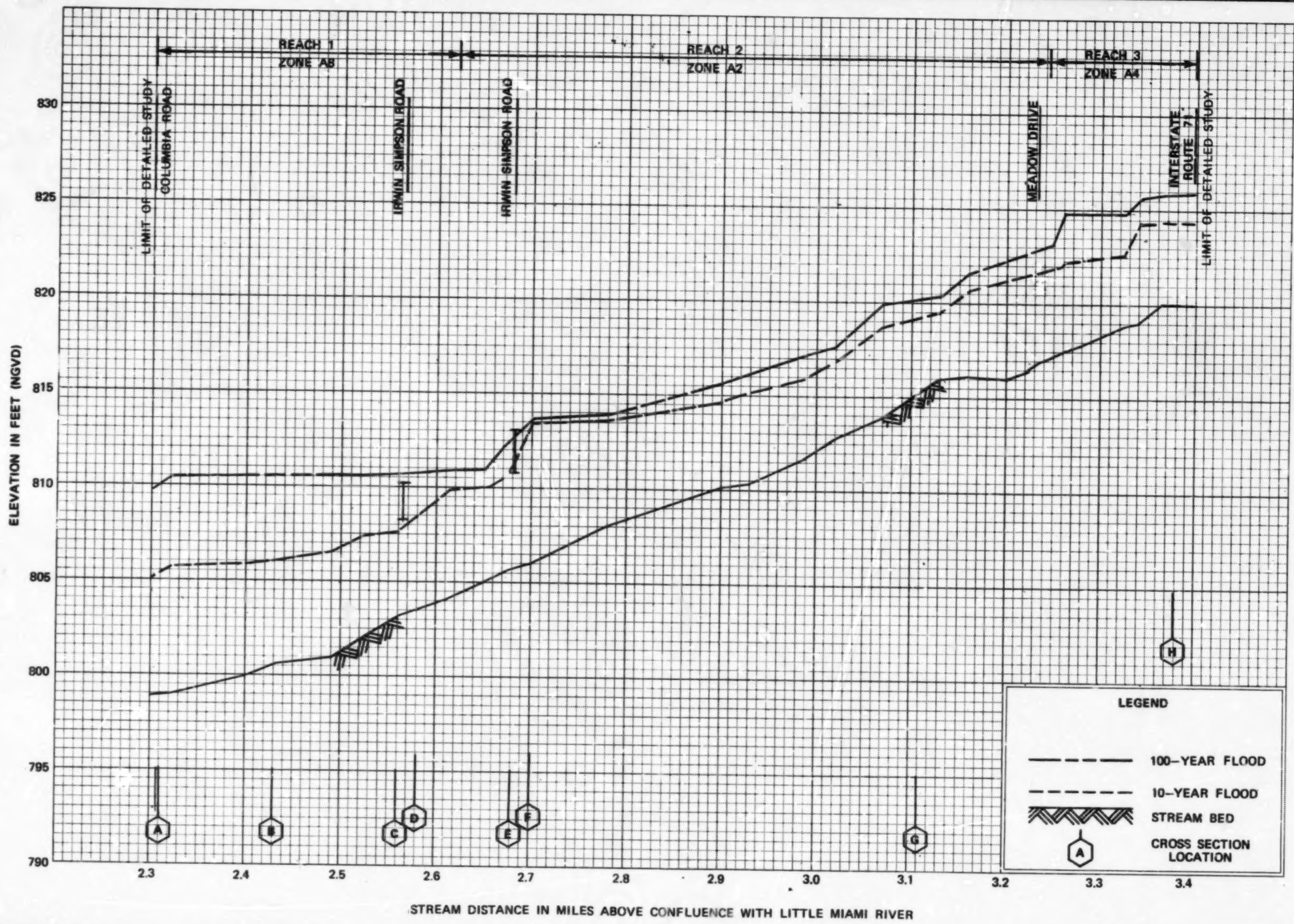

FLOOD PROFILES

SIMPSON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

70P

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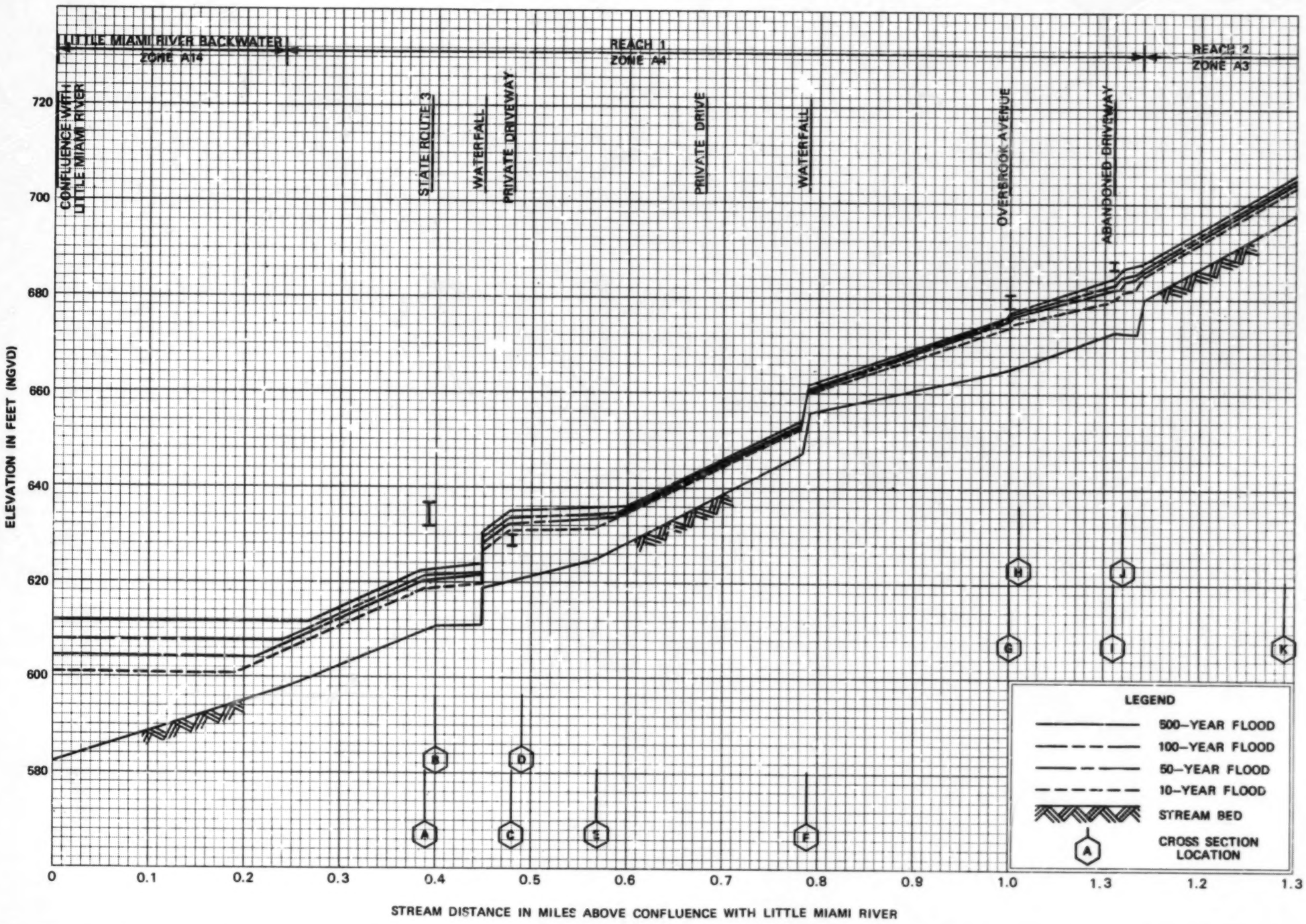

FLOOD PROFILES

BEAR RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

71P

REVISED: 8/4/87

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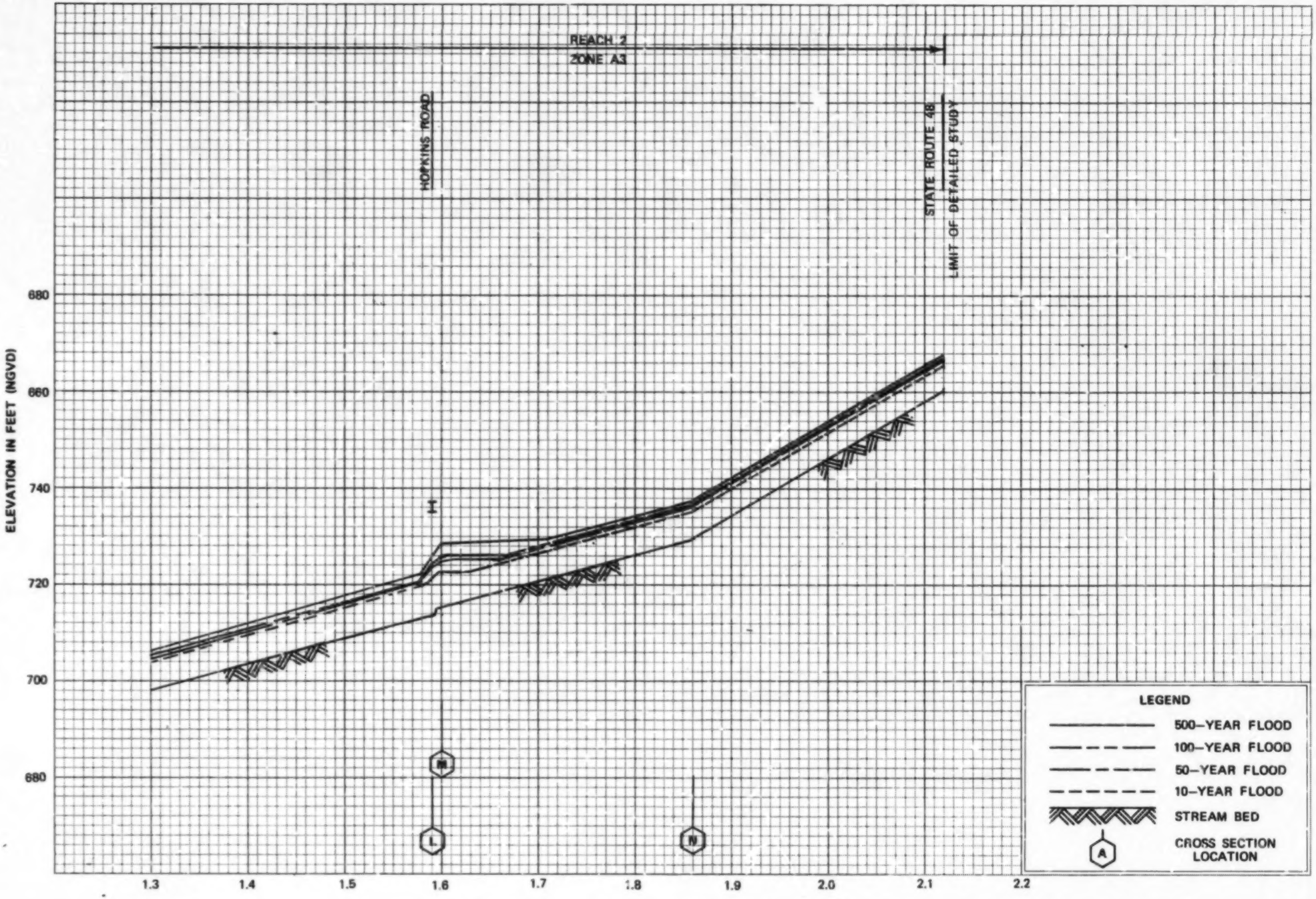

FLOOD PROFILES

BEAR RUN

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

72P

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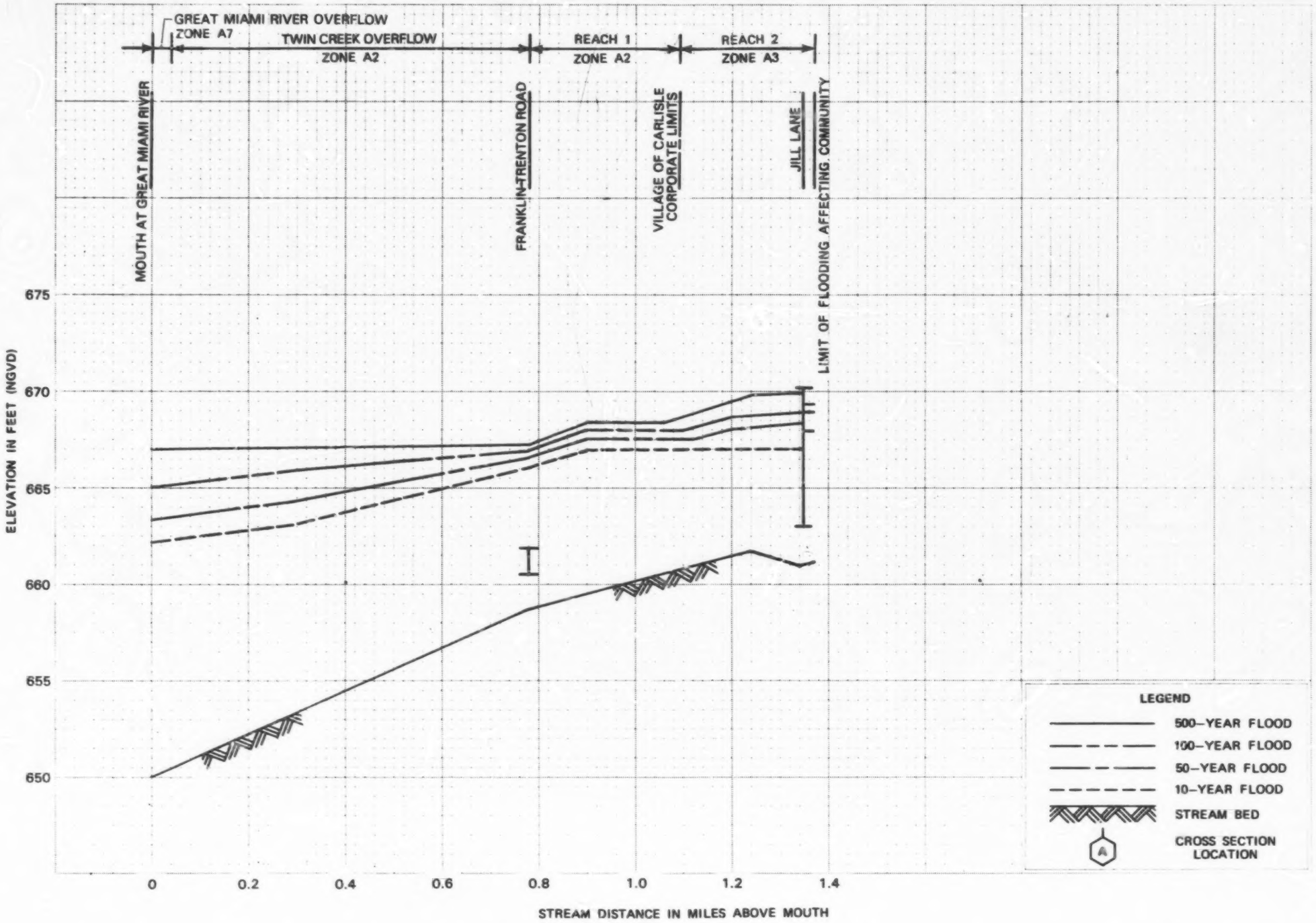

FLOOD PROFILES

CARLISLE DRAIN

FEDERAL EMERGENCY MANAGEMENT AGENCY

COUNTY OF WARREN, OH
(UNINCORPORATED AREAS)

73P

REVISED: 9/4/87

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